FINAL
Site Inspection Report
New Hampshire National Guard Training Site
Center Strafford, New Hampshire

Site Inspection for Perfluorooctanoic Acid (PFOA), Perfluorooctanesulfonic Acid (PFOS), Perfluorohexanesulfonic Acid (PFHxS), Perfluorononanoic Acid (PFNA), Hexafluoropropylene Oxide Dimer Acid (HFPO-DA), and Perfluorobutanesulfonic Acid (PFBS)
ARNG Installations, Nationwide

August 2023

Prepared for:

Army National Guard Headquarters
111 S. George Mason Drive
Arlington, VA 22204

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LIST OF ACRONYMS AND ABBREVIATIONS

°C	Degrees Celsius
°F	Fahrenheit
%	Percent
µg/kg	Microgram(s) per kilogram
AECOM	AECOM Technical Services, Inc.
AFFF	Aqueous Film Forming Foam
AGQS	Ambient Quality Groundwater Standards
amsl	Above mean sea level
AOI	Area of Interest
ARNG	Army National Guard
bgs	Below ground surface
btoc	Below top of casing
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Chain-of-custody
CSM	Conceptual site model
DA	Department of the Army
DoD	Department of Defense
DOT	Department of Transportation
DPT	Direct-push technology
DQI	Data quality indicator
DQO	Data quality objective
DUA	Data Usability Assessment
EA	EA Engineering, Science, and Technology, Inc., PBC
EB	Equipment Blank
EIS	Extraction internal standards
ELAP	Environmental Laboratory Accreditation Program
EM	Engineer Manual
FB	Field blank
FedEx	Federal Express
ft	Foot (feet)
FTS	fluorotelomer sulfonate
GAC	Granulated activated carbon
GPR	Ground penetrating radar
GPS	Global positioning system
HA	Health Advisor
HDPE	High-density polyethylene

HFPO-DA	Hexafluoropropylene oxide dimer acid
HQ	Hazard Quotient
HSA	hollow stem auger
IDW	Investigation-derived waste
ITRC	Interstate Technology Regulatory Council
LC/MS/MS	Liquid chromatography tandem mass spectrometry
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
LOQ	Limit of quantification
MIL-SPEC	military specification
MS	Matrix spike
MSD	Matrix spike duplicate
NELAP	National Environmental Laboratory Accreditation Program
ng/L	Nanogram(s) per liter
NHNGTS	New Hampshire National Guard Training Site
No.	Number
OSD	Office of the Secretary of Defense
PA	preliminary assessment
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PID	photoionization detector
ppt	parts per trillion
PQAPP	Programmatic Uniform Federal Policy Quality Assurance Project Plan
PVC	polyvinyl chloride
QA	Quality assurance
QAPP	Quality Assurance Project Plan
QC	Quality control
QSM	Quality Systems Manual
RI	Remedial investigation
RPD	Relative percent difference
SDS	Safety Data Sheet
SI	Site Inspection
SL	Screening level

TOC	Total organic carbon
TPP	Technical Project Planning
UFP	Uniform Federal Policy
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
Wood	Wood Environment & Infrastructure Solutions, Inc.
WSP	WSP USA Environment & Infrastructure, Inc.

EXECUTIVE SUMMARY

The Army National Guard (ARNG) G-9 is performing Preliminary Assessments (PAs) and Site Inspections (SIs) at ARNG facilities nationwide based on the current or potential historical use of per- and polyfluoroalkyl substances (PFAS) with a focus on the six compounds presented in the memorandum regarding Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program (Assistant Secretary of Defense, 2022) from the Office of the Secretary of Defense (OSD) dated 6 July 2022. The six compounds listed in the OSD memorandum include perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluorobutanesulfonic acid (PFBS), perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), and hexafluoropropylene oxide dimer acid (HFPO-DA)[1]. These compounds are collectively referred to as "relevant compounds" throughout the document, and the applicable Screening Levels (SLs) are provided below in **Table ES-1**.

The PA identified Areas of Interest (AOIs) where PFAS-containing materials were used, stored, and/or disposed, or released historically (see **Table ES-2** for AOI locations). The objective of the SI is to identify whether there has been a release to the environment from the AOIs identified in the PA and determine whether further investigation is warranted, a removal action is required to address immediate threats, or no further action is required based a comparison of SI results to screening levels (SLs) for the relevant compounds. This SI was completed at the New Hampshire National Guard Training Site (NHNGTS) in Center Strafford, New Hampshire and determined that further investigation is warranted for AOI 1 (the only AOI investigated): Current Leach Field and AOI 2: Former Leach Field. NHNGTS will also be referred to as the "Facility" throughout this document.

The Facility, operated by New Hampshire ARNG (NHARNG), encompasses approximately 104.7 acres in Center Strafford, New Hampshire. The NHNGTS is located at 1 Austin Cate Drive, Center Strafford, New Hampshire 03884. Agricultural lands border the Facility to the southeast and northwest. The northeast edge of the Facility and beyond is forested. Currently, the NHNGTS property is owned by the State of New Hampshire and operated by both the New Hampshire Army National Guard (federal technicians), and state employees who are personnel of the State of New Hampshire Department of Military Affairs and Veterans Services.

The PA identified one AOI for investigation during the SI phase, based on engineering drawings that indicated that the current and former leach fields were in the same location. SI sampling results from the AOI were compared to OSD SLs. After the SI fieldwork was completed, NHARNG determined that the former leach field was located southwest (and upgradient) of the current leach field. Based on this new information, one additional potential PFAS release area was identified, AOI 2: Former Leach Field. As the identification of AOI 2 did not occur until after the SI fieldwork, AOI 2 was not investigated as part of the SI. **Table ES-2** summarizes the

[1] Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the conceptual site model (CSM) developed during the PA and revised based on SI findings, the presence of HFPO-DA is not anticipated at the facility because HFPO-DA is generally not a component of military specification (MIL-SPEC) aqueous film forming foam (AFFF) and based on its history including distribution limitations that restricted use of GenX, it is generally not a component of other products the military used. In addition, it is unlikely that GenX would be an individual chemical of concern in the absence of other PFAS.

SI results for the AOIs. Based on the results of this SI, further evaluation under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is warranted in a Remedial Investigation (RI) for the area upgradient of AOI 1. The detections in the groundwater at locations upgradient of AOI 1 may be related to the former leach field (AOI 2), an unidentified on-Facility source, or a potential off-Facility source not under control of ARNG. Potential upgradient sources will be investigated as part of the RI. No further action is warranted for AOI 1.

Table ES-1. Screening Levels (Soil and Groundwater)

Analyte[1,2]	Residential (Soil) (µg/kg)[1]	Industrial / Commercial Composite Worker (Soil) (µg/kg) [1]	Tap Water (Groundwater) (ng/L)[1]
PFOA	19	250	6
PFOS	13	160	4
PFBS	1,900	25,000	601
PFHxS	130	1,600	39
PFNA	19	250	6

Notes:
1. Assistant Secretary of Defense. July 2022. Risk Based Screening Levels in Groundwater and Soil using United States Environmental Protection Agency's (USEPA's) Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. May 2022.
2. Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the CSM developed during the PA and revised based on SI findings, the presence of HFPO-DA is not anticipated at the facility because HFPO-DA is generally not a component of MIL-SPEC AFFF and based on its history including distribution limitations that restricted use of GenX, it is generally not a component of other products the military used. In addition, it is unlikely that GenX would be an individual chemical of concern in the absence of other PFAS

Abbreviations:
µg/kg = microgram(s) per kilogram
bgs = below ground surface
ng/L = nanogram(s) per liter

Table ES-2. Summary of Site Inspection Findings and Recommendations

AOI	Potential Release Area	Soil – Source Area	Groundwater – Source Area	Future Action
1	Current Leach Field	◐	◐	No Further Action
	Source Upgradient of AOI 1	TBD	●	Proceed to RI
2	Former Leach Field	TBD	TBD	Proceed to RI

Legend:
● = Detected; exceedance of screening levels
◐ = Detected; no exceedance of screening levels
○ = Not detected

1. INTRODUCTION

1.1 PROJECT AUTHORIZATION

The Army National Guard (ARNG) G-9 is the lead agency in performing Preliminary Assessments (PAs) and Site Inspections (SIs) at ARNG facilities nationwide based on the current or potential historical use of per- and polyfluoroalkyl substances (PFAS) with a focus on the six compounds presented in the memorandum regarding Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program (Assistant Secretary of Defense, 2022) from the Office of the Secretary of Defense (OSD) dated 6 July 2022. The six compounds listed in the OSD memorandum are referred to as "relevant compounds" throughout this document and include perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluorobutanesulfonic acid (PFBS), perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), and hexafluoropropylene oxide dimer acid (HFPO-DA)[1]. The ARNG performed this SI at the New Hampshire National Guard Training Site (NHNGTS) in Center Strafford, New Hampshire. The NHNGTS is also referred to as the "Facility" throughout this report.

The SI project elements were performed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (U.S. Environmental Protection Agency [EPA], 1980), as amended, the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations Part 300; EPA, 1994), and in compliance with U.S. Department of Army (DA) requirements and guidance for field investigations.

1.2 SITE INSPECTION PURPOSE

A PA was performed at the NHNGTS (AECOM Technical Services, Inc. [AECOM], 2019) that identified one Area of Interest (AOI) where PFAS-containing materials were used, stored, and/or disposed, or released historically. The objective of the SI is to identify whether there has been a release to the environment from the AOI identified in the PA and determine whether further investigation is warranted, a removal action is required to address immediate threats, or no further action is required based on screening levels (SLs) for the relevant compounds.

[1] Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the conceptual site model (CSM) developed during the PA and revised based on SI findings, the presence of HFPO-DA is not anticipated at the facility because HFPO-DA is generally not a component of military specification (MIL-SPEC) aqueous film forming foam (AFFF) and based on its history including distribution limitations that restricted use of GenX, it is generally not a component of other products the military used. In addition, it is unlikely that GenX would be an individual chemical of concern in the absence of other PFAS.

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2. FACILITY BACKGROUND

2.1 FACILITY LOCATION AND DESCRIPTION

The NHNGTS occupies approximately 104.7 acres of land in Center Strafford in the Lakes Region of New Hampshire (**Figure 2-1**). Center Strafford is located approximately 7.5 miles southwest of Rochester, New Hampshire, and 24 miles northwest of Portsmouth, New Hampshire. Parker Mountain of the Blue Hill Range is located north of the Facility and Bow Lake is located several miles to the southwest. The Isinglass River is located several miles southeast. The Facility is accessible from Austin Cate Drive from the south, off Parker Mountain Road (Route 126).

The Facility was originally developed in 1833 as a boarding school under the name Strafford Union Academy. In the early 1900s, the school changed its name to the Austin Cate Academy and underwent several improvements over the course of the century. In 1985, the property was sold to the State of New Hampshire. Currently, the NHNGTS property is owned by the State of New Hampshire and operated by both the New Hampshire Army National Guard (federal technicians), and state employees who are personnel of the State of New Hampshire Department of Military Affairs and Veterans Services.

2.2 FACILITY ENVIRONMENTAL SETTING

The approximate center of the Facility is located at 43°16'42.6" North latitude and 71°07'16.1" West longitude at 500 feet (ft) above mean sea level (amsl). The Facility topography is dominated by a ridge that separates the Facility into northern and southern drainage areas. The crest of the ridge lies northeast of the cantonment area and runs across the Facility. Agricultural lands border the Facility to the southeast and northwest. The northeast portion of the Facility and beyond is forested (AECOM, 2019).

Center Strafford is a rural residential community with a total population of approximately 4,114. Strafford County is primarily agricultural and forested land with a total population of approximately 130,090 (US Census Bureau, 2018; AECOM, 2019).

The following sections include information on geology, hydrogeology, hydrology, climate, and current and future land use. The topography at the Facility is shown on **Figure 2-2**. The regional geology and groundwater features are shown on **Figure 2-3**. The regional surface water features are shown on **Figure 2-4**. Groundwater elevations and contours are presented on **Figure 2-5**.

2.2.1 Geology

Strafford County is situated within the New England Physiographic Province of the Appalachian Highlands (Billings, 1980; AECOM, 2019). The Facility is underlain by Late Devonian Binary Granite. This medium-grained, gray granite is part of the Hampshire Plutonic series. The surrounding metamorphic bedrock is part of the Jenness Pond Schist of the Littleton Formation. Pleistocene deposits overlying igneous and metamorphic bedrock consist of glacial till, sand, gravel, and clay. Depth to bedrock is approximately 20 ft on the ridge just northeast of the cantonment area. Bedrock in the northeastern section of the Facility is identified as occurring 12

ft below ground surface (bgs) (Jacobs Engineering Group, 2013; AECOM, 2019). Data on depth to bedrock in the lower elevations of the Facility (near the wetlands in the northeastern portion of the Facility) are not available (NHARNG, 2014; AECOM, 2019). During the SI, depth to bedrock was observed from 5 to 14 ft bgs.

During the SI, nine borings were advanced between 9 and 30 ft bgs. The soil was classified as well graded sand with varying levels of fines overlying low to medium plasticity silt at seven of the nine boring locations. The grain size analysis conducted on the soil sample collected from the AOI confirms the field observation of well graded sand and silt.

2.2.2 Hydrogeology

The shallow glacial stratified-drift aquifers, made up of layers of sand, gravel, clay, and silt overlying bedrock, are the primary source of groundwater in this region of New Hampshire. Groundwater within the shallow overburden aquifer has been measured at varying depths across the Facility, likely due to variations in lithology and temporal variations in groundwater level. A hardpan soil layer is found just below the surface in the unforested parts of the Facility, which impacts vertical mobility of water; therefore, the infiltration of precipitation to recharge the shallow aquifer is limited. Groundwater flow in the overburden aquifer is presumed to follow the slope of the topography. There are no confining layers between the shallow aquifer and the bedrock aquifer below (Nobis Engineering, 2006; AECOM, 2019), providing a potential pathway for vertical migration from the overburden aquifer. The regional groundwater flow is to the east (ERT, 2008; AECOM, 2019).

Static depth to groundwater measured during the May 2022 SI ranged from 7.93 to 17.18 ft bgs. Groundwater elevation contours from the SI are presented on **Figure 2-5** and indicate the groundwater flow direction at AOI 1 is primarily to the northeast, following the topography. Because the current leach field is designed as an infiltration area, localized mounding may occur resulting in radial flow away from the leach field (AECOM, 2019).

Groundwater is the primary source of drinking water in the Center Strafford area. Most, if not all, drinking water wells penetrate and derive water from the bedrock. NHNGTS is currently served by drinking water supply wells. There are institutional wells in Center Strafford less than one mile southeast of the Facility boundary and numerous private domestic drinking water wells surrounding the Facility (AECOM, 2019). Groundwater features in the vicinity of the Facility are shown on **Figure 2-3**.

The NHARNG sampled the private water supply wells at the NHNGTS (Well #1 and Well #4) for PFAS in March 2017. Two pre-treatment (pre-filtration) samples were collected, one from each well, and one post-treatment sample was collected, which consisted of water from both Well #1 and Well #4. Nine of the 18 PFAS compounds analyzed were detected in Well #4 pre-treatment, with PFOS and PFOA detected at 5.12 and 9.38 parts per trillion (ppt), respectively. Only one PFAS compound, 6:2 fluorotelomer sulfonate (FTS), was detected in Well #1 pre-treatment. All detected compounds were below the New Hampshire Ambient Groundwater Quality Standards (AGQS) and the United States Environmental Protection Agency (USEPA) Health Advisories (HAs) (Tetra Tech, 2017). The NHNGTS Well #5 was sampled for PFAS in

June 2020. None of the 18 PFAS compounds analyzed were detected in the Well #5 water sample (Bureau Veritas Laboratories, 2020).

2.2.3 Hydrology

The Facility lies within the Nippo Brook - Isinglass River sub-watershed of the Cocheco River watershed. Surface water from the southern portion of the Facility flows south-southwest towards the Cocheco River, which eventually joins the Isinglass River (Nobis Engineering, 2006; AECOM, 2019). The elevation of the Mohawk River, located north of the Facility, is below the elevation of the surface of the groundwater near the Facility. Therefore, groundwater flow from the Facility is likely to flow into the Mohawk River, which acts as boundary preventing groundwater from the Facility interacting with drinking water wells east of the Mohawk River (ERT, 2008; AECOM, 2019). Surface water features in the vicinity of the Facility are shown on **Figure 2-4**.

Topography at the NHNGTS is dominated by a ridge that separates the Facility into a northern and southern drainage patterns. The crest of this ridge lies northeast of the cantonment area at the edge of the parade field and runs northwest to southeast. Based on topography and newly installed drainage, parts of the cantonment area likely drain to the southeast and southwest, and the operational ranges drain to the northeast. A hardpan layer is found below the surface of the unforested parts of the Facility. This low permeability layer restricts vertical movement of water, creating an erosion potential for the Facility during rain events (ERT, 2008; AECOM, 2019).

The wetland resources are situated on the northern end of the Facility at the base of a rather steep hill. The dominant wetland consists of a large scrub shrub and emergent beaver influenced wetland associated with an unnamed stream flowing roughly west to east across the Facility. Several intermittent streams flow out of this large wetland under the woods road through culverts and connect to other forested wetland areas. The flow in these streams appears to vary depending on water levels and beaver activity. Several intermittent streams, originating as hillside seeps, also flow in the wetland system from the south. A number of wetlands have been identified on and off the Facility as part of the National Wetlands Inventory Field, and delineation by the NHARNG further identified freshwater wetlands on the Facility. These wetlands include vernal ponds and both intermittent and permanent water bodies. Additionally, a small pond is located on the northern end of the NHNGTS (NHARNG, 2014; AECOM, 2019).

Stormwater flow within the cantonment area generally flows in a southerly direction toward New Hampshire Route 126. There are several storm drain structures, including small diameter cross culverts, under driveways and drainage pipes exiting isolated catch basins. Stormwater flowing off the Facility to the south disperses into drainage channels parallel to New Hampshire Route 126. The remainder of the Facility consists of primarily pervious land cover, allowing for infiltration of precipitation. Stormwater runoff for the northern tier of the NHNGTS (beyond the cantonment area) generally flows in a northerly direction, draining to the wetland complex or the tributary to the Mohawk River (EA, 2018; AECOM, 2019).

2.2.4 Climate

The Facility lies within the humid continental climate zone, which is characterized by long, cold, snowy winters, very warm (and at times humid) summers, and relatively brief autumns and springs. The average maximum temperature ranges from 83°Fahrenheit (°F) in July to 31°F in January. The average minimum temperature ranges from 58°F in July to 14°F in January. In winter, successive storms deliver light to moderate snowfall amounts, contributing to the relatively reliable snow cover. Summer can bring stretches of humid conditions, as well as thunderstorms. Average annual rainfall is 46 inches (US Climate Data, 2019; AECOM, 2019).

2.2.5 Current and Future Land Use

The NHARNG uses the NHNGTS for federal small arms and maneuver training. Facilities at the NHNGTS include a kitchen and dining hall, a drill hall, a running track, barracks buildings, and multiple-use operational range areas. The entire Facility, including all ranges, is also open for public recreational use and hunting. The NHARNG does not regulate hunting on the Facility but estimates that there are less than 20 hunters per year (ERT, 2008; AECOM, 2019). The Facility is not fenced and is open to the public.

Future land use will intensify over the next few years under a newly proposed Master Plan which will maximize development at the NHNGTS. New barracks and training ranges are part of the proposed facilities. Future land use in the immediate area is not expected to change and will remain rural in character.

2.2.6 Sensitive Habitat and Threatened/Endangered Species

A number of wetlands have been identified at the northern end of the Facility as part of the National Wetlands Inventory (AECOM, 2019), however, a wildlife survey of the Facility was not available. Sensitive habitat includes the exemplary natural community of the black gum-red maple swamp at the far northeast of the property. The following species are listed as federally endangered, threatened, proposed, and/or candidate species in Strafford County, New Hampshire (U.S. Fish and Wildlife Service, 2022):

Birds: Roseate Tern, *Sterna dougallii* (endangered).

Insects: Monarch Butterfly, *Danaus plexippus* (candidate)

Mammals: Northern Long-eared Bat, *Myotis septentrionalis* (threatened).

Flowering Plants: Small Whorled Pogonia, *Isotria medeoloides* (threatened).

2.3 HISTORY OF PFAS USE

The NHNGTS currently uses a single common leach field (constructed in 1993) for wastewater disposal for the entire Facility. Septic tanks are located outside each building, and then individual building sewage is collected by gravity sewers and conveyed to the leach field via a single pump

station and twin force mains. The leach field piping is located below ground surface. Engineering drawings reviewed during the PA indicated that the current leach field was built in the same location as the former leach field (AECOM, 2019), however, after the SI fieldwork was completed, information was provided by NHARNG indicating that the former leach field was located southwest (and upgradient) of the current leach field. The approximate geographic coordinates for the current leach field are 43°16'31.9"N; 71°07'28.8"W (AECOM, 2019).

The former leach field was constructed prior to the NHNGTS occupying the property. The former leach field was utilized by the Austin Cate Academy, and by the NHNGTS from 1985 until 1993, when the new leach field was constructed. Based on information provided by NHARNG after the SI, the location of the former leach field was southwest (and upgradient) of the current leach field.

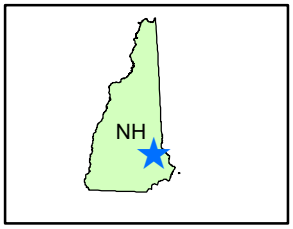
In the PA, the current and former leach fields were thought to be in the same location and were identified as an AOI (AOI 1) due to discharges of floor polish, which potentially contain PFAS, to drains connected to the Facility's septic system. According to NHNGTS personnel, the floors in the kitchen and drill hall are polished with Centi Finish floor polish. The floor polish is mixed with water in a bucket, and after polishing is complete, the unused mixture is discharged to the drain in each respective building. The mixture is subsequently transported through the Facility's septic system to the leach field and released to the subsurface (AECOM, 2019). The Centi Finish bottle and Safety Data Sheet (SDS) maintained by the NHNGTS indicate the formula is proprietary; however, some floor polishes are known to contain PFAS. The SDS was dated 2012, but interviewees were unaware of when use of the Centi Finish began. It is likely that floor polish (Centi Finish or possibly other brands) has been used in buildings since the NHARNG occupied the buildings (AECOM, 2019).

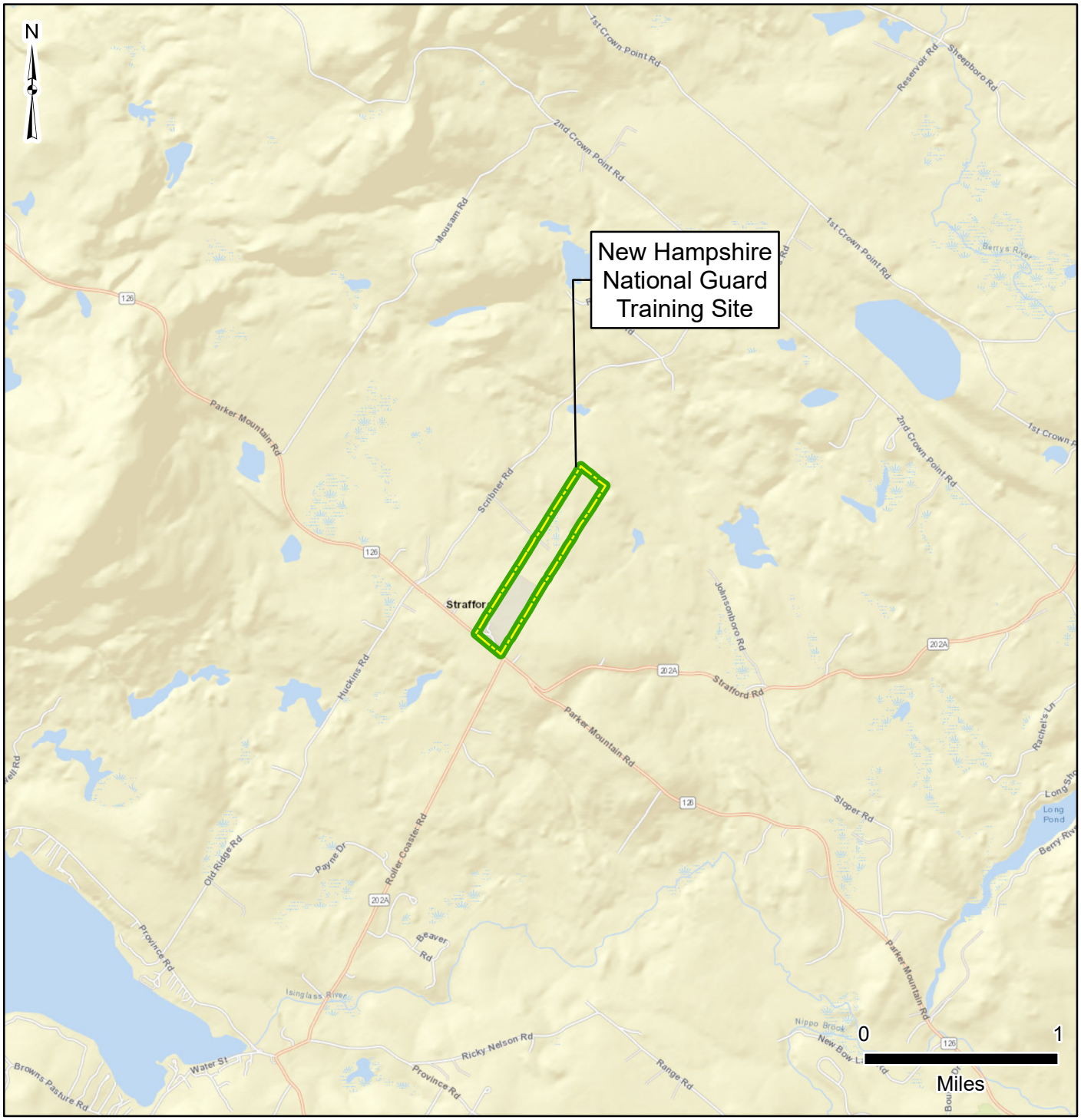
During preparation of the SI Report, it was discovered that the current leach field was not constructed in the same location as the former leach field. AOI 1, which was investigated during the SI, is the location of the current leach field. The former leach field was located southwest (and upgradient) of the current leach field and was not investigated as part of the SI. Following the SI, the former leach field was identified as a second AOI (AOI 2) due to the potential discharge of floor polish while it was in use. AOI 2 will be investigated as part of the RI.

A description of the AOI is presented in **Section 3**.

Army National Guard Site Inspections
Site Inspection Report
New Hampshire National Guard Training Site
Center Strafford, New Hampshire

Figure 2-1
Facility Location





Facility Data

Facility Boundary

Data Sources:
ESRI 2020
AECOM 2019

Date:.....September 2022
Prepared By:.....WSP
Prepared For:.....USACE

Document Path: C:\Users\bridgette.fritz\OneDrive - Wood PLC\Army National Guard Maps\Strafford National Guard Training Site\MXDs\Site Inspection Report\Figure 2-1 Facility Location.mxd

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Army National Guard Site Inspections
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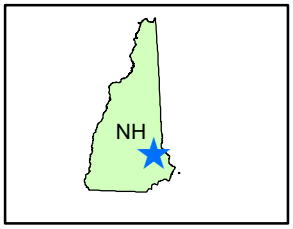
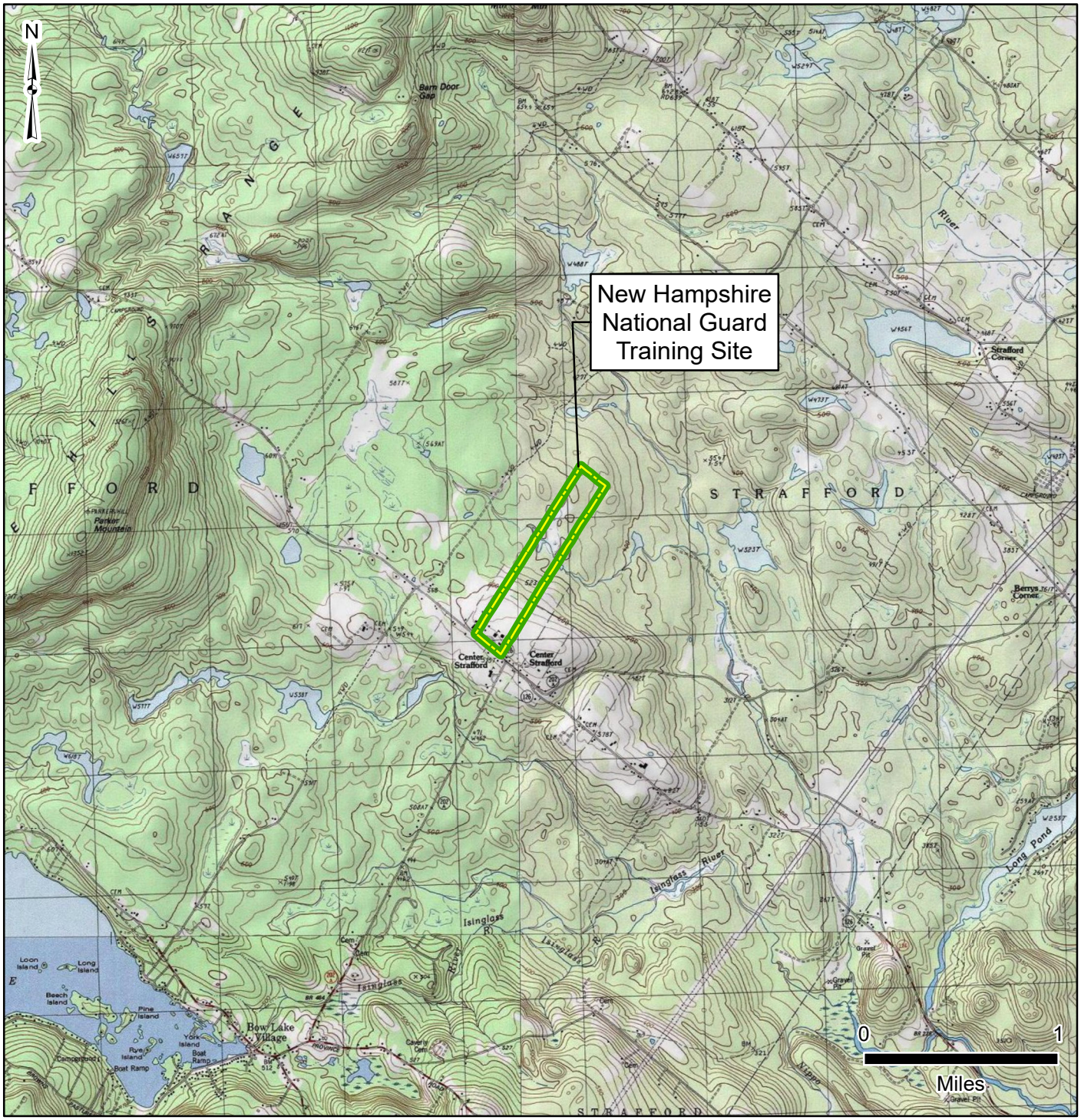


Figure 2-2
Facility Topography



Facility Data

Facility Boundary

Note:
Contour elevation recorded in ft. asml.

Data Sources:
ESRI 2020
AECOM 2019

Date:.....September 2022
Prepared By:.....WSP
Prepared For:.....USACE

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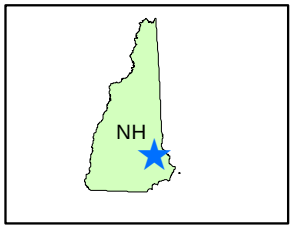
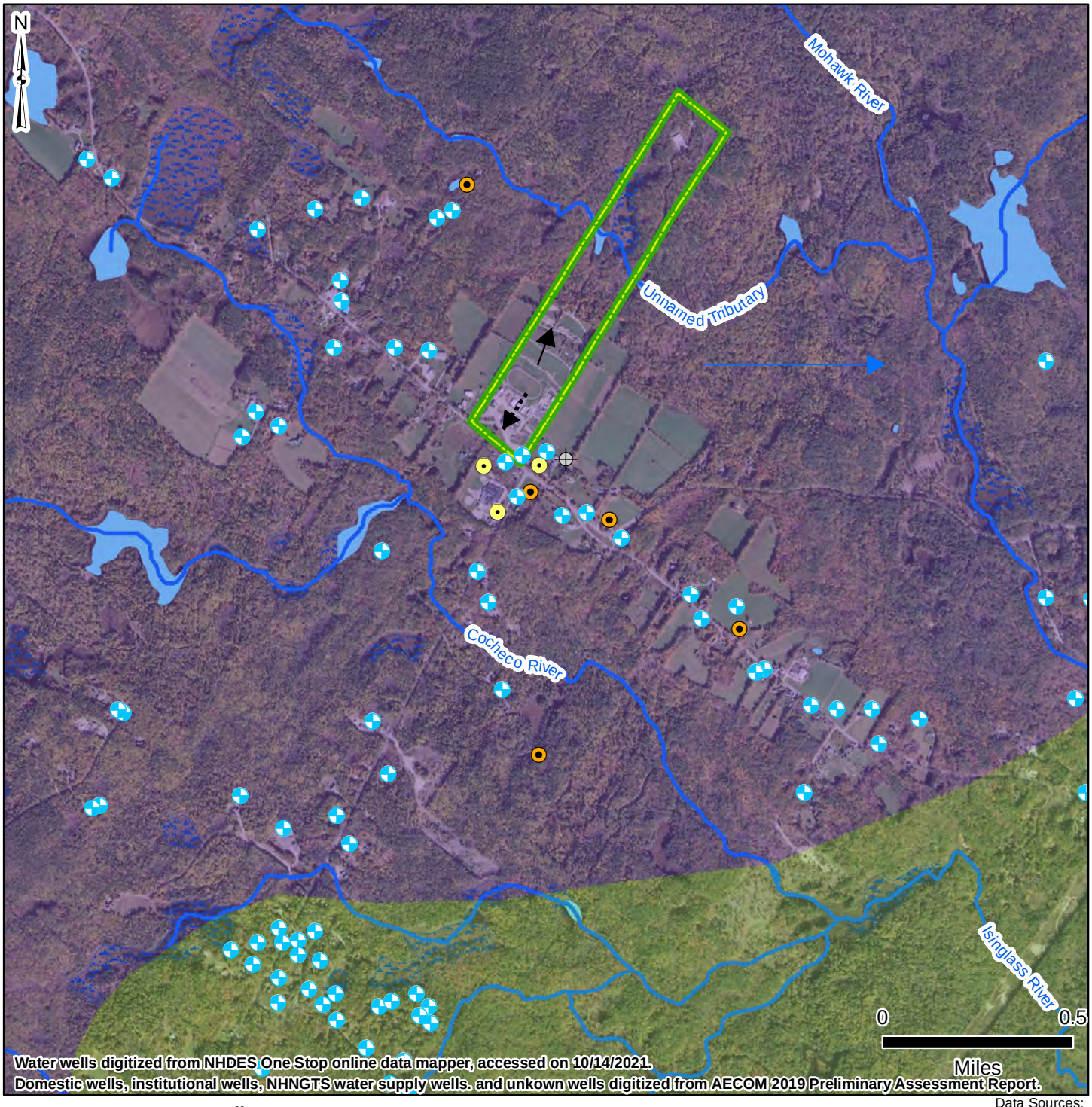
Army National Guard Site Inspections
Site Inspection Report
New Hampshire National Guard Training Site
Center Strafford, New Hampshire

Figure 2-3
Groundwater Features





Water wells digitized from NHDES One Stop online data mapper, accessed on 10/14/2021.
Domestic wells, institutional wells, NHNGTS water supply wells. and unkown wells digitized from AECOM 2019 Preliminary Assessment Report.

Facility Data
- Facility Boundary

Geology
- Concord Granite
- Perry Mountain Formation

Well Type
- Water Well
- Domestic Well
- Institutional Well
- Unknown Well

Hydrology/Hydrogeology
- Local Groundwater Flow Direction
- Inferred Local Groundwater Flow Direction
- Regional Groundwater Flow Direction
- River/Stream
- Water Body
- Wetland

Data Sources:
NHDES 2021
ESRI 2020
AECOM 2019

Note: Certain features digitized from georeferenced AECOM Preliminary Assessment Report (2019) figures.
Date:.....September 2022
Prepared By:.....WSP
Prepared For:.....USACE

Document Path: P:\Army National Guard PFAS Maps\Strafford National Guard Training Site\Strafford National Guard Training Site\MXDs\Site Inspection Report\Figure 2-3 Groundwater Features.mxd

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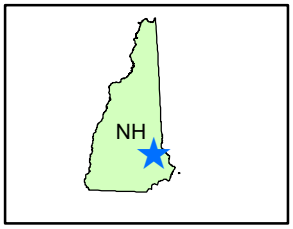
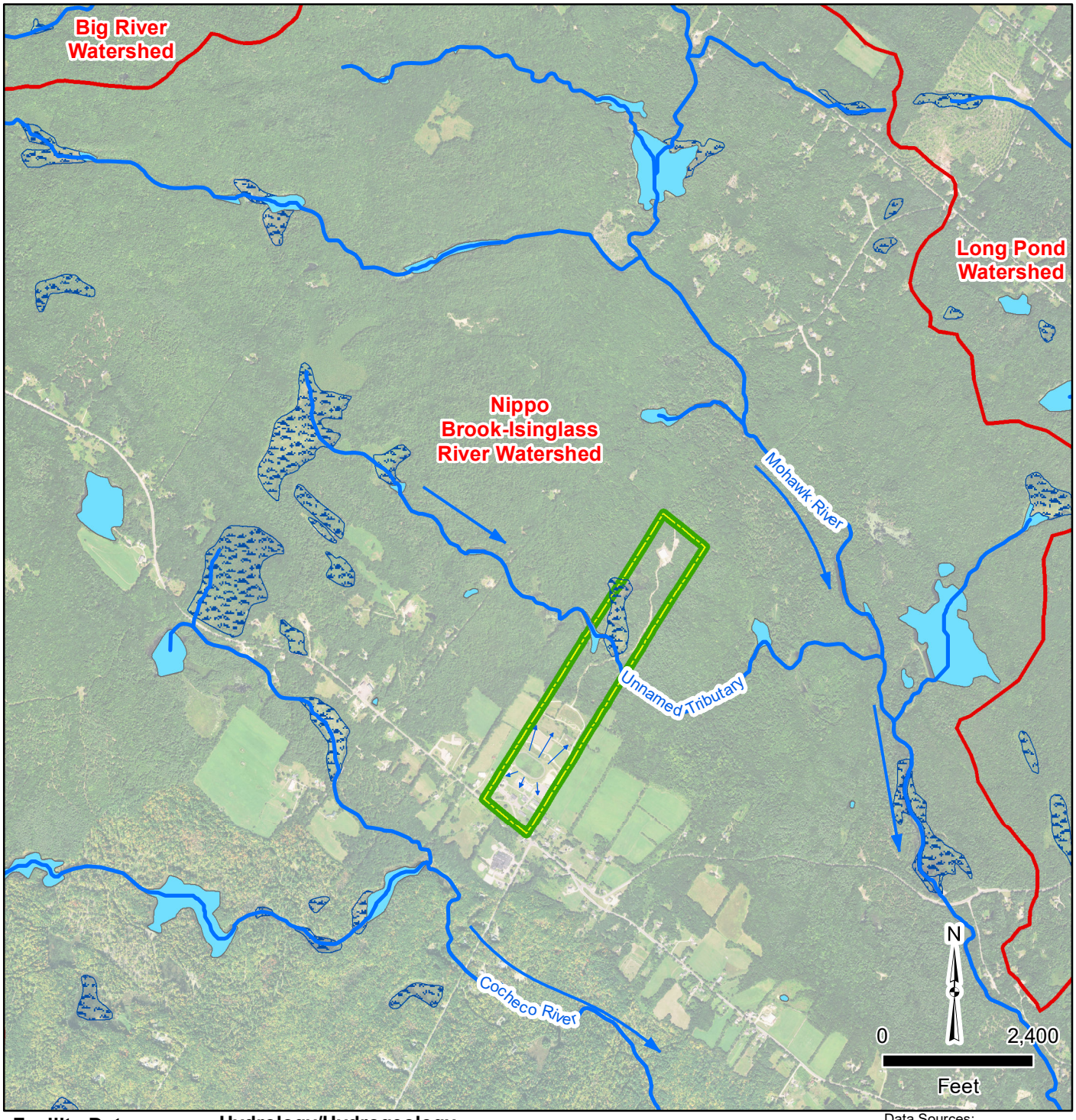
Army National Guard Site Inspections
Surface Inspection Report
New Hampshire National Guard Training Site
Center Strafford, New Hampshire

Figure 2-4
Surface Water Features





Facility Data
- Facility Boundary

Hydrology/Hydrogeology
- General Surface Water Flow Direction
- River/Stream
- Water Body
- Wetland
- Watershed

Data Sources:
ESRI 2020
AECOM 2019
National Hydrography Dataset

Note: Certain features digitized from georeferenced AECOM Preliminary Assessment Report (2019) figures.

Date:.....September 2022
Prepared By:.....WSP
Prepared For:.....USACE

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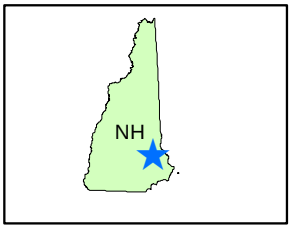
Army National Guard Site Inspections
Site Inspection Report
New Hampshire National Guard Training Site
Center Strafford, New Hampshire

Figure 2-5
Groundwater Elevations
May 2022



Facility Data

- Area of Interest
- Potential PFAS Release
- Facility Boundary

Sample Location

- Temporary Monitoring Well

Hydrology/Hydrogeology

- Local Groundwater Flow Direction
- Inferred Local Groundwater Flow Direction
- Regional Groundwater Flow Direction
- Surface Water Flow Direction
- Groundwater Elevation Contour (10-foot interval)

Note: Certain features digitized from georeferenced AECOM Preliminary Assessment Report (2020) figures.
Vertical Datum is based on NAVD88.
All units are in U.S. Survey feet.

Date:.....March 2022
Prepared By:.....WSP
Prepared For:.....USACE

Document Path: P:\Army National Guard PFAS Maps\Strafford National Guard Training Site\Strafford National Guard Training Site\MXDs\Site Inspection Report\Figure 2-5 Groundwater Elevations, May 2022.mxd

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3. SUMMARY OF AREAS OF INTEREST

The PA evaluated areas where PFAS-containing materials may have been used, stored, disposed, or released historically. Based on the PA findings, one potential release area was identified at NHNGTS and identified as: AOI 1 Current and Former Leach Field. During preparation of the SI Report, it was discovered that the current leach field was not constructed in the same location as the former leach field. AOI 1, which was investigated during the SI, is the location of the current leach field. The former leach field was located southwest (and upgradient) of the current leach field and was not investigated as part of the SI. Following the SI, the former leach field was identified as a second AOI (AOI 2) due to the potential discharge of floor polish while it was in use. AOI 2 will be investigated as part of the RI. The AOIs are shown on **Figure 3-1**.

3.1 AOI 1 – CURRENT LEACH FIELD

AOI 1 is the current leach field. According to interviews with NHNGTS personnel, floor polish is used in the kitchen and drill hall, and after polishing is complete, the unused polish mixture is poured into the drain in each respective building (AECOM, 2019). Although the brand used by the NHNGTS has a proprietary formula, and therefore PFAS content cannot be confirmed, some floor polishes are known to contain PFAS (Interstate Technology Regulatory Council [ITRC], 2017). Drains in the buildings lead to septic tanks located outside each building, and then individual building sewage is conveyed to the leach field. The current leach field was constructed in 1993, prior to which, the former leach field was used (See **Section 3.2**).

Because liquids potentially containing PFAS were discharged into the wastewater system which flows to the leach field, and the piping for the leach field was below the ground surface, there is the potential for PFAS to have been released directly to the subsurface soil (AECOM 2019).

Groundwater is the primary source of drinking water in the Center Strafford area. Most, if not all, drinking water wells penetrate and derive water from the bedrock. NHNGTS is currently served by three private, ARNG-owned drinking water supply wells, there are two municipal wells in Center Strafford less than one mile southeast of the Facility boundary, and there are numerous domestic drinking water wells surrounding the Facility (**Figure 2-3**). Additionally, there are agricultural areas in the vicinity that may produce products for human consumption. Regional groundwater flow is to the east and local groundwater flow follows the topography, which is toward the northeast at AOI 1. Because the leach field is designed as an infiltration area, localized mounding may occur resulting in radial flow away from the leach field (AECOM, 2019). There are no confining layers between the shallow aquifer and the bedrock aquifer below (Nobis Engineering, 2006; AECOM, 2019), providing a potential pathway between AOI 1 and the bedrock aquifer below.

PFAS are water soluble and can migrate readily from soil to groundwater. Because potential PFAS releases to subsurface soil at AOI 1 may have occurred, PFAS may migrate from the subsurface soil to the groundwater via leaching.

3.2 AOI 2 – FORMER LEACH FIELD

Following the SI fieldwork, new information was provided by NHARNG indicating that the current leach field had not been constructed in the location of the former leach, as was previously noted in the PA. The former leach field was located southwest and upgradient of the current leach field. The former leach field was used by the Austin Cate Academy and was also used by the NHNGTS from 1985 to 1993.

Regional groundwater flow is to the east and local groundwater flow is assumed to follow the topography. Groundwater elevations were not measured in the location of AOI 2 during the SI; however, the groundwater flow is likely north/northeast based on the topography. There are no confining layers between the shallow aquifer and the bedrock aquifer below (Nobis Engineering, 2006; AECOM, 2019), providing a potential pathway between AOI 2 and the bedrock aquifer below.

PFAS are water soluble and can migrate readily from soil to groundwater. Because potential PFAS releases to subsurface soil at AOI 2 may have occurred, PFAS may migrate from the subsurface soil to the groundwater via leaching.

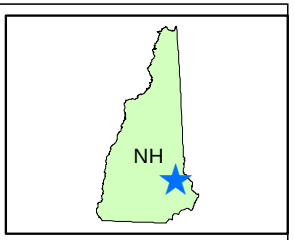
3.3 ADJACENT SOURCES

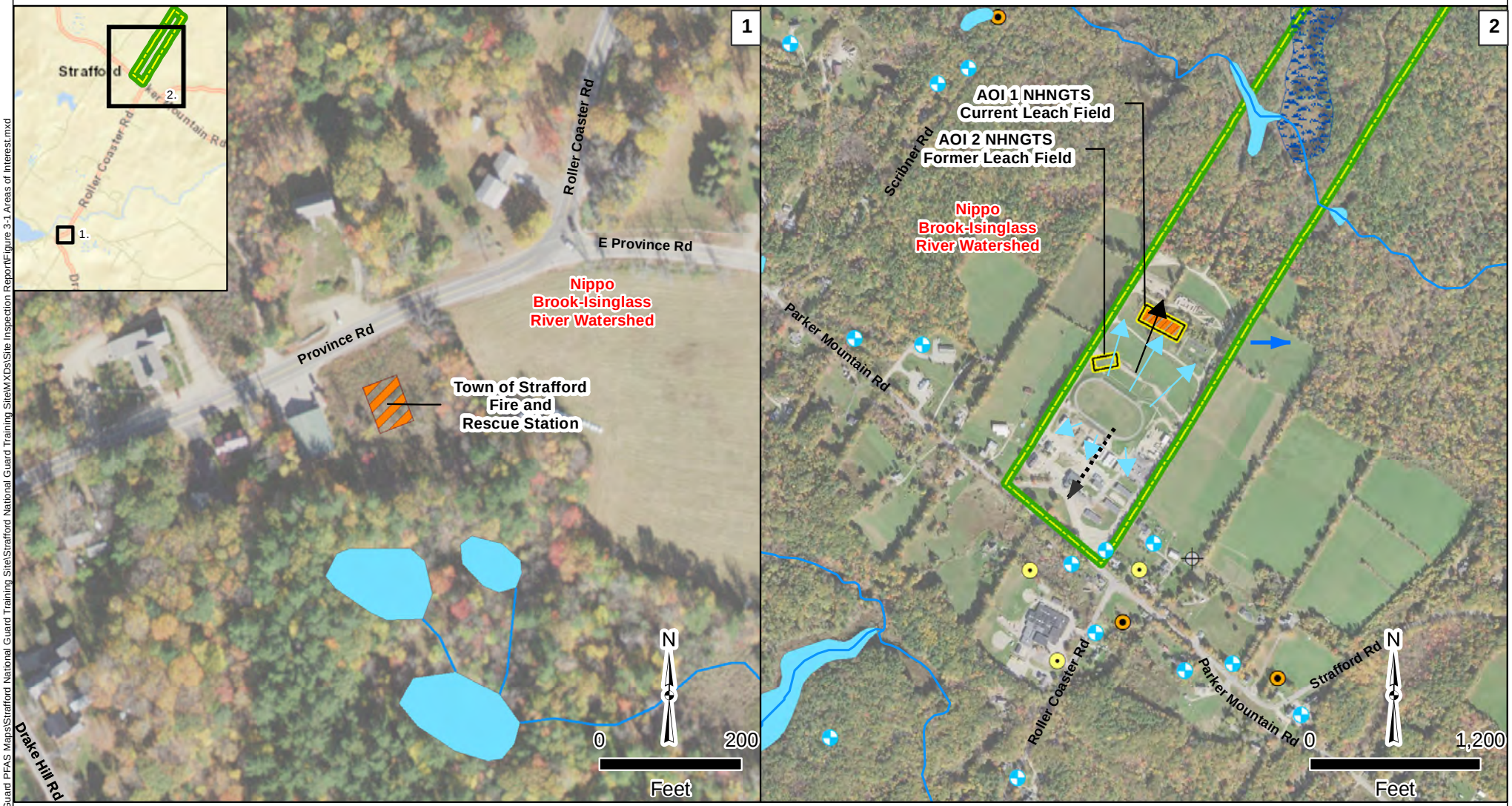
The Strafford Fire and Rescue Station is located approximately two miles south of the NHNGTS and could be a potential off-Facility source of PFAS. The Strafford Fire and Rescue Station has the potential for current or historical use of AFFF, but this was not confirmed during the PA. Based on the topography of the Facility, this source is not expected to impact PFAS concentrations in shallow groundwater at the Facility. However, the groundwater gradient for the bedrock aquifer is largely influenced by fractures in crystalline bedrock and drinking water wells in the vicinity of the NHNGTS vary considerably in depth. While the regional groundwater flow is to the east, it is unclear if potential PFAS sources adjacent to the Facility are located hydraulically downgradient, or upgradient, of the NHNGTS bedrock water supply wells (AECOM, 2019).

The potential off-Facility source is shown on **Figure 3-1**.

Army National Guard Site Inspections
Site Inspection Report
Strafford National Guard Training Site
Strafford, New Hampshire

Figure 3-1
Areas of Interest





Facility Data
- Area of Interest
- Potential PFAS Release
- Facility Boundary

Well Type
- Water Well
- Domestic Well
- Institutional Well
- Unknown Well

Hydrology/Hydrogeology
- River/Stream
- Water Body
- Wetland
- Local Groundwater Flow Direction
- Inferred Local Groundwater Flow Direction
- Regional Groundwater Flow Direction
- Surface Water Flow Direction

Water wells digitized from NHDES One Stop online data mapper, accessed on 10/14/2021.

Domestic wells, institutional wells, NHNGTS water supply wells. and unkown wells digitized from AECOM 2019 Preliminary Assessment Report.

Note: Certain features digitized from georeferenced AECOM Preliminary Assessment Report (2019) figures.

Date:.....March 2023
Prepared By:.....WSP
Prepared For:.....USACE

Document Path: P:\Army National Guard PFAS Maps\Strafford National Guard Training Site\Strafford National Guard Training Site\MXDs\Site Inspection Report\Figure 3-1 Areas of Interest.mxd

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4. PROJECT DATA QUALITY OBJECTIVES

As identified during the Data Quality Objective (DQO) process and outlined in the SI Uniform Federal Policy (UFP)-Quality Assurance Project Plan (QAPP) Addendum (EA Engineering, Science, and Technology, Inc., PBC [EA]/Wood, 2022), the objective of the SI is to identify whether there has been a release to the environment at the AOIs identified in the PA. For each AOI, ARNG determines if further investigation is warranted, a removal action is required to address immediate threats, or whether no further action is warranted. This SI evaluated groundwater and soil for the presence or absence of relevant compounds at the sampled AOI.

4.1 PROBLEM STATEMENT

ARNG will recommend AOIs for remedial investigation (RI) if site-related soil and groundwater samples have concentrations of the relevant compounds above the OSD risk-based screening levels. The SLs are presented in **Section 6.1** of this Report.

4.2 INFORMATION INPUTS

Primary information inputs for the SI include the following:

- The PA Report for NHNGTS (AECOM, 2019);
- Analytical data from groundwater and soil samples collected as part of this SI in accordance with the site-specific UFP –QAPP Addendum (EA/Wood, 2022); and
- Field data collected during the SI, including groundwater elevation and water quality parameters measured at the time of sampling.

4.3 STUDY BOUNDARIES

The scope of the SI was bounded horizontally by the property limits of the Facility (**Figures 2-1** and **2-2**). The scope of the SI was bounded vertically by the depth of temporary monitoring wells installed within groundwater, where encountered (maximum depth of 30 ft bgs). Off-Facility sampling was not included in the scope of this SI. If future off-Facility sampling is required, the proper stakeholders will be notified, and necessary rights of entry will be obtained by ARNG with property owner(s). Temporal boundaries were limited to the earliest available time field resources were available to complete the study.

4.4 ANALYTICAL APPROACH

Samples were analyzed by Eurofins, accredited under the DoD Environmental Laboratory Accreditation Program (DoD ELAP; Accreditation Number 1.01) and the National Environmental Laboratory Accreditation Program (NELAP; Certificate Number 021). Data were compared to applicable SLs and decision rules as defined in the UFP-QAPP Addendum (EA/Wood, 2022).

4.5 DATA USABILITY ASSESSMENT

The Data Usability Assessment (DUA), which is provided in Appendix A, is an evaluation at the conclusion of data collection activities that uses the results of both data verification and validation in the context of the overall project decisions or objectives. Using both quantitative and qualitative methods, the assessment determines whether project execution and the resulting data have met installation specific DQOs. Both sampling and analytical activities are considered to assess whether the collected data are of the right type, quality, and quantity to support the decision-making (DoD, 2019a; DoD, 2019b; USEPA, 2017).

Based on the DUA, the environmental data collected during the SI were found to be acceptable and usable for this SI evaluation with the qualifications documented in the DUA and its associated data validation reports. These data are of sufficient quality to meet the objectives and requirements of the UFP-QAPP (EA, 2020).

5. SITE INSPECTION ACTIVITIES

This section describes the environmental investigation and sampling activities that occurred as part of the SI. The SI sampling approach was based on the findings of the PA and was implemented in accordance with the following approved documents.

- *Final Preliminary Assessment Report, New Hampshire National Guard Training Site, New Hampshire,* dated December 2019 (AECOM, 2019)
- *Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan, Site Inspections for Per- and Polyfluoroalkyl Substances Impacted Sites, ARNG Installations, Nationwide,* dated December 2020 (EA, 2020)
- *Final Site Inspection Uniform Federal Policy-Quality Assurance Project Plan Addendum, New Hampshire National Guard Training Site, New Hampshire* dated May 2022 (EA/Wood, 2022)
- *Final Programmatic Accident Prevention Plan,* dated October 2021 (EA, 2021)
- *Final Site Safety and Health Plan, New Hampshire National Guard Training Site, New Hampshire,* dated October 2021 (EA/Wood, 2021).

The SI field activities were conducted from 9 to 23 May 2021 and consisted of utility clearance, direct-push technology (DPT) and hollow stem auger (HSA) boring installation and soil sample collection, temporary monitoring well installation, grab groundwater sample collection, and land surveying. Field activities were conducted in accordance with the UFP-QAPP Addendum (EA/Wood, 2022), except as noted in **Section 5.8**.

The following samples were collected during the SI and analyzed for 24 compounds via liquid chromatography/tandem mass spectrometry (LC/MS/MS) compliant with QSM Version 5.3 Table B-15 to fulfill the project DQOs:

- Seven (7) soil samples from three locations (AOI01-01, AOI01-02, and AOI01-03);
- Six (6) grab groundwater samples from temporary well locations (AOI01-04 through AOI01-09);
- Fifteen (15) quality assurance (QA)/QC samples.

Figure 5-1 provides the sample locations for all media across the Facility. **Table 5-1** presents the list of samples collected for each medium. Field documentation is provided in **Appendix B**. A log of Daily Notice of Field Activity was completed throughout the SI field activities, which is provided in **Appendix B1**. Sampling forms are provided in **Appendix B2**, and land survey data are provided in **Appendix B3**. Investigation-derived waste (IDW) placement locations are shown in **Appendix B4**. Additionally, a photographic log of field activities is provided in **Appendix C**.

5.1 PRE-INVESTIGATION ACTIVITIES

In preparation for the SI field activities, project team members participated in Technical Project Planning (TPP) meetings, performed utility clearance, and sampled decontamination source water. Details of these activities are presented below.

5.1.1 Technical Project Planning

The U.S. Army Corps of Engineers (USACE) TPP Process, Engineers Manual (EM) 200-1-2 (DA 2016a) defines four phases to project planning: (1) defining the project phase; (2) determining data needs; (3) developing data collection strategies; and (4) finalizing the data collection plan. The process encourages stakeholder involvement in the SI, beginning with defining overall project objectives, including DQOs, and formulating a sampling approach to address the AOI identified in the PA.

A combined TPP Meeting 1 and 2 was held on 18 March 2022, prior to SI field activities. Meeting minutes are provided in **Appendix D**. The combined TPP Meeting 1 and 2 was conducted in general accordance with EM 200-1-2. The stakeholders for this SI include, ARNG, USACE, NHARNG, NHDES, and representatives familiar with the Facility, the regulations, and the community. Stakeholders were provided the opportunity to make comments on the technical sampling approach and methods at the combined TPP Meeting 1 and 2. The outcome of the combined TPP Meeting 1 and 2 was memorialized in the UFP-QAPP Addendum (EA/Wood, 2022).

A TPP Meeting 3 was held after the field event to discuss the results of the SI. Meeting minutes for TPP 3 are included in Appendix D of this report. Future TPP meetings will provide an opportunity to discuss results and findings, and future actions, where warranted.

5.1.2 Utility Clearance

WSP USA Environment & Infrastructure, Inc. (WSP), formerly doing business as Wood Environment & Infrastructure Solutions, Inc. (Wood), contacted DigSafe to notify them of intrusive work at the Facility. WSP contracted Corbuilt, LLC, a private utility location service, to perform utility clearance at the Facility. Utility clearance was performed at each of the proposed boring locations on 9 May 2022 with input from the WSP field team. General locating services and ground-penetrating radar (GPR) were used to complete the clearance. Additionally, an attempt was made to pre-clear the first 5 ft of each boring using a hand auger by WSP's drilling subcontractor, Parratt-Wolff, Inc. Due to shallow hard pan, hand auger refusal occurred shallower than 5 ft bgs at all locations. Concurrence from stakeholders was received on 10 May 2022 to deviate from the UFP-QAPP requirement to hand auger the first 5 ft at each boring and proceed with DPT methods based on the results of the Dig Safe and results from the private utility locating.

5.1.3 Source Water and PFAS Sampling Equipment Acceptability

The potable water source used for decontamination of drilling equipment was confirmed to meet acceptability criteria, as defined in the UFP-QAPP Addendum, prior to the start of field activities. A sample from a potable water source at the NHNGTS, was collected on 8 April 2022, prior to mobilization, and analyzed for PFAS by LC/MS/MS compliant with QSM 5.3 Table B-15 (DoD, 2020). The results of the sample of the potable water source used for decontamination of drilling equipment during the SI are provided in **Appendix F**. A discussion of the results is presented in the DUA (**Appendix A**).

Materials that were used within the sampling zone were confirmed as acceptable for use in the PFAS sampling environment. The checklist of acceptable materials for use in the PFAS sampling environment was provided in the Standard Operating Procedures appendix to the Programmatic UFP-QAPP (PQAPP) (EA, 2020).

5.2 SOIL BORINGS AND SOIL SAMPLING

Soil samples were collected via DPT drilling methods in accordance with Standard Operating Procedure 047 *Direct-Push Technology Sampling* (EA, 2020*).* A Geoprobe® 7822DT dual-tube sampling system was used to collect continuous soil cores to the target depth. An attempt was made to use a hand auger to clear the top 5 ft of each boring in compliance with utility clearance procedures; however, hand auger refusal occurred shallower than 5 ft bgs at all locations. As the locations had all been pre-cleared for utilities, drilling proceeded using DPT methods (see **Section 5.1.2**). The soil boring locations are shown on **Figure 5-1**, and boring sample depths are provided in **Table 5-1**. Several boring locations were adjusted within a 50-ft offset for reasons including drill rig access, utility avoidance and bias toward sampling within observed drainage features.

Discrete soil samples were collected for chemical analysis at three locations in the vicinity of the current leach field: AOI01-01, AOI01-02, and AOI01-03. At each of these locations, one shallow subsurface soil sample was collected (3 to 5 ft bgs) and one deeper subsurface soil samples was collected at approximately 1 foot above the groundwater table (5 to 9 ft bgs). Additionally, one soil sample was collected at the mid-point between the surface and the groundwater table at AOI01-01 (5 to 7 ft bgs). Due to shallow groundwater, midpoint samples were not collected at AOI01-02 and AOI01-03. Groundwater was encountered at depths ranging from 8.6 to 29 ft bgs during drilling. Total boring completion depths, to accommodate temporary well installation, ranged from 15 to 30 ft bgs.

During the drilling, the soil cores were continuously logged for lithological descriptions by a field geologist using the Unified Soil Classification System. A photoionization detector (PID) was used to screen the breathing zone during boring activities as a part of personal safety requirements. Observations and measurements were recorded on sampling forms (**Appendix B2**) and in a non-treated field logbook. Depth interval, recovery thickness, PID concentrations, moisture, relative density, Munsell color, and Unified Soil Classification System texture were recorded. The boring logs are provided in **Appendix E**.

Soil borings completed during the SI classified the soil as sand with varying levels of fines overlying a layer of low to medium plasticity silt with varying levels of clay and sand as the lithology of the unconsolidated sediments below the NHNGTS. Bedrock was identified at depths between 5 and 14 ft bgs. The borings were completed at depths between 9 and 30 ft bgs. These observations are consistent with the understood depositional environment of the region.

Each sample was collected into a laboratory-supplied PFAS-free high-density polyethylene (HDPE) bottle and labeled using a PFAS-free marker or pen. Samples were packaged on ice and transported via Federal Express (FedEx) under standard chain-of-custody (COC) procedures to the laboratory and analyzed for PFAS (LC/MS/MS compliant with QSM Version 5.3 Table B-15), total organic carbon (TOC) (EPA Method 9060A), pH (EPA Method 9045D), and grain size (ASTM Method D-422) in accordance with the UFP-QAPP Addendum (EA/Wood, 2022).

Field duplicate samples were collected at a rate of 10% and analyzed for the same parameters as the accompanying samples. Matrix Spike/Matrix Spike Duplicates (MS/MSDs) were collected at a rate of 5% and analyzed for the same parameters as the accompanying samples. In instances when non-dedicated sampling equipment was used, such as a hand auger for the shallow soil samples, one equipment blank (EB) was collected per day and analyzed for the same parameters as the soil samples. A temperature blank was placed in each cooler for use in confirming that samples were preserved at or below 6 degrees Celsius (°C) during shipment.

DPT borings were converted to temporary wells, which were subsequently abandoned after sampling and surveying in accordance with the UFP-QAPP Addendum (EA/Wood 2022). After removal of the casings, boreholes were abandoned using bentonite chips.

5.3 TEMPORARY WELL INSTALLATION AND GROUNDWATER GRAB SAMPLING

Temporary monitoring wells were installed using a Geoprobe® 7822DT drill rig using both direct-push and HSA drilling methods, supplemented with an air hammer where groundwater was encountered deeper than top of bedrock. Once the borehole was advanced to the desired depth, a temporary well was constructed of a 5-ft section of 1-inch Schedule 40 poly-vinyl chloride (PVC) screen with sufficient casing to reach the ground surface. New PVC pipe and screen were used at each location to avoid cross contamination between locations. The screen intervals for the temporary wells are provided in **Table 5-2**.

Groundwater samples were collected, using a peristaltic pump with PFAS-free HDPE tubing. Samples were collected after a period of time following well installation to allow groundwater to infiltrate and recharge the temporary well intervals. The temporary wells were purged at a rate determined in the field to reduce turbidity and draw down prior to sampling. Water quality parameters (e.g., temperature, specific conductance, pH, dissolved oxygen, and oxidation-reduction potential) were measured using a water quality meter and recorded on the field sampling form (**Appendix B2**) before each grab sample was collected in a separate container. Additionally, a subsample of each groundwater sample was collected in a separate container, and a shaker test was completed to identify if there were any foaming. No foaming was noted in any of the groundwater samples.

Each sample was collected in laboratory-supplied PFAS-free HDPE bottles and labeled using a PFAS-free marker or pen. Samples were packaged on ice and transported via FedEx under standard COC procedures to the laboratory and analyzed for PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 in accordance with the UFP-QAPP Addendum (EA/Wood, 2022).

Field duplicate samples were collected at a rate of 10% and analyzed for the same parameters as the accompanying samples. MS/MSDs were collected at a rate of 5% and analyzed for the same parameters as the accompanying samples. Six field blanks (FBs) were collected in accordance with the UFP-QAPP Addendum (EA/Wood, 2022). A temperature blank was placed in each cooler for use in confirming that samples were preserved at or below 6°C during shipment.

Following well surveying (described below in **Section 5.7**), temporary wells were abandoned in accordance with the SI UFP-QAPP Addendum (EA/Wood, 2022) by removing the PVC and backfilling the hole with soil cuttings and bentonite chips.

5.4 SYNOPTIC WATER LEVEL MEASUREMENTS

Synoptic water level elevation measurements were collected from the newly installed temporary monitoring wells prior to sampling. Water level measurements were taken from the survey mark on the northern side of the well casing. Groundwater elevation data is provided in **Table 5-3**. A groundwater flow contour map is provided as **Figure 2-5**.

5.5 SURVEYING

The northern side of each new temporary well casing was surveyed following guidelines provided in the SOPs provided in the SI QAPP Addendum (EA/Wood, 2022). Positions were collected in the applicable Universal Transverse Mercator zone projection with World Geodetic System 1984 datum (horizontal) and North American Vertical Datum 1988 (vertical). Surveying data were collected on 20 May 2022 and are provided in **Appendix B3**.

5.6 INVESTIGATION-DERIVED WASTE

As of the date of this report, the disposal of PFAS IDW is not regulated federally. IDW generated during the SI is considered non-hazardous waste and was managed in accordance with the UFP-QAPP Addendum (EA/Wood, 2022).

Soil IDW (i.e., soil cuttings) generated during the SI activities were returned to the borehole from which they originated. The soil IDW was not sampled and assumes the characteristics of the associated soil samples collected from that source location.

Liquid IDW generated during SI activities (purge water, decontamination fluids) were treated using granular activated carbon (GAC) and contained in two labeled, 55-gallon Department of Transportation (DOT)-approved steel drums and left onsite as directed by Facility personnel. The liquid IDW was sampled following the SI fieldwork and is awaiting disposal. The status of the IDW disposal will be added to this report before it is finalized.

Geographic coordinates were collected using a Global positioning system (GPS) at each location where IDW was placed (i.e., boreholes). The IDW placement locations are displayed on the figure in **Appendix B4**.

Other solids such as spent personal protective equipment, plastic sheeting, tubing, rope, unused monitoring well construction materials, and other environmental media generated during the field activities were disposed of off-Facility at a licensed solid waste landfill.

5.7 LABORATORY ANALYTICAL METHODS

Samples were analyzed by LC/MS/MS, compliant with QSM Version 5.3 Table B-15, at Eurofins in Lancaster, Pennsylvania, a DoD ELAP and NELAP-certified laboratory.

Soil samples were also analyzed for TOC using EPA Method 9060A, pH by EPA Method 9045D, and grain size using ASTM Method D-422.

5.8 Deviations from SI UFP-QAPP Addendum

Deviations from the UFP-QAPP Addendum occurred based on conditions encountered during field activities. These deviations were discussed with the project delivery team. The deviations from the UFP-QAPP Addendum are noted below:

Borings were unable to be pre-cleared to 5’ using a hand auger by WSP’s drilling subcontractor due to shallow hardpan.

Soil sample locations AOI01-01, AOI01-02, AOI01-03, and AOI01-06 were adjusted within a 50-ft offset for reasons including drill rig access, utility avoidance and bias toward sampling within observed drainage features.

Due to shallow groundwater at locations AOI01-02 and AOI01-03, no midpoint subsurface soil samples were collected.

Table 5-1. Site Inspection Samples by Medium
New Hampshire National Guard Training Site, Center Strafford, New Hampshire
Site Inspection Report

Sample Identification	Sample Collection Date	Sample Depth (ft bgs)	PFAS LC/MS/MS compliant with QSM 5.3 Table B-15)	TOC (EPA Method 9060A)	pH (EPA Method 9045D)	Grain Size (ASTM D422)	Comments
Soil Samples							
AOI01-01-SB-(3-5)	5/17/22	3-5	X				Parent Sample of DUP-02
AOI01-01-SB-(3.0-3.5)	5/10/22	3.0-3.5		X	X		
AOI01-01-SB-(5-7)	5/17/22	5-7	X				MS/MSD Collected
AOI01-01-SB-(7-9)	5/17/22	7-9	X				
AOI01-02-SB-(3-5)	5/10/22	3-5	X				
AOI01-02-SB-(5-9)	5/10/22	5-9	X				
AOI01-03-SB-(3-5)	5/10/22	3-5	X				
AOI01-03-SB-(5-8)	5/10/22	5-8	X				
AOI01-03-SB-(8.6-12)	5/10/22	8.6-12				X	
DUP-02	5/17/22	3-5	X				Field Duplicate
Groundwater Samples							
AOI01-04-GW-(14)	5/14/22	14	X				
AOI01-05-GW-(19)	5/17/22	19	X				
AOI01-06-GW-(14)	5/17/22	14	X				
AOI01-07-GW-(20)	5/13/22	20	X				
AOI01-08-GW-(13)	5/19/22	13	X				
AOI01-09-GW-(28)	5/12/22	28	X				Parent Sample of DUP-01
DUP-01	5/12/22	28	X				MS/MSD Collected Field Duplicate
Blank Samples							
(NHNGTS)-EB-01	5/10/22	-	X				Equipment Blank Collected from Hand Auger
(NHNGTS)-EB-02	5/10/22	-	X				Equipment Blank Collected from Driller's Water Tank
(NHNGTS)-EB-03	5/11/22	-	X				Equipment Blank Collected from Water Level Meter
(NHNGTS)-EB-04	5/12/22	-	X				Equipment Blank Collected from Dedicated Tubing
(NHNGTS)-EB-05	5/13/22	-	X				Equipment Blank Collected from Water Level Meter
(NHNGTS)-EB-06	5/17/22	-	X				Equipment Blank Collected from Water Level Meter
(NHNGTS)-EB-07	5/17/22	-	X				Equipment Blank Collected from Water Level Meter
(NHNGTS)-FB-01	5/10/22	-	X				
(NHNGTS)-FB-02	5/11/22	-	X				
(NHNGTS)-FB-03	5/12/22	-	X				
(NHNGTS)-FB-04	5/13/22	-	X				
(NHNGTS)-FB-05	5/17/22	-	X				

Sample Identification	Sample Collection Date	Sample Depth (ft bgs)	PFAS LC/MS/MS compliant with QSM 5.3 Table B-15)	TOC (EPA Method 9060A)	pH (EPA Method 9045D)	Grain Size (ASTM D422)	Comments
(NHNGTS)-FB-06	5/19/22	-	X				

Notes:
NHNGTS = New Hampshire National Guard Training Site
ASTM = American Society for Testing and Materials
bgs = below ground surface
EB = equipment blank
FB = field blank
ft = feet
MS/MSD = matrix spike/ matrix spike duplicate
QSM = Quality Systems Manual
TOC = total organic carbon
USEPA = United States Environmental Protection Agency

Table 5-2. Soil Boring Depths and Temporary Well Screen Intervals
New Hampshire National Guard Training Site, Center Strafford, New Hampshire
Site Inspection Report

Area of Interest	Boring Location	Soil Boring Depth (ft bgs)	Temporary Well Screen Interval (ft bgs)
1	AOI01-01	9.0	-
	AOI01-02	13.0	-
	AOI01-03	12.0	-
	AOI01-04	15.0	10.0-15.0
	AOI01-05	21.5	16.5-21.5
	AOI01-06	16.0	11.0-16.0
	AOI01-07	22.0	17.0-22.0
	AOI01-08	15.0	10.0-15.0
	AOI01-09	30.0	25.0-30.0

Notes:
bgs = below ground surface
ft = feet

Table 5-3. Groundwater Elevation
New Hampshire National Guard Training Site, Center Strafford, New Hampshire
Site Inspection Report

Monitoring Well ID	Top of Casing Elevation (ft NAVD88)	Depth to Water (ft btoc)	Depth to Water (ft bgs)	Groundwater Elevation (ft NAVD 88)
AOI01-04	595.30	8.85	7.96	586.45
AOI01-05	602.34	15.45	13.70	586.89
AOI01-06	613.57	7.93	6.81	605.64
AOI01-07	635.90	13.38	11.99	622.52
AOI01-08	602.44	8.92	8.56	593.52
AOI01-09	566.17	17.18	15.78	548.99

Notes:
bgs = below ground surface
btoc = below top of casing
ft = feet
NAVD88 = North American Vertical Datum 1988

Army National Guard Site Inspections
Site Inspection Report
Strafford National Guard Training Site
Strafford, New Hampshire

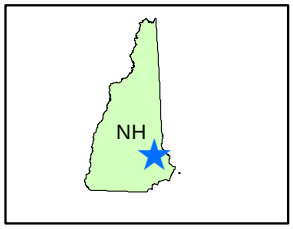
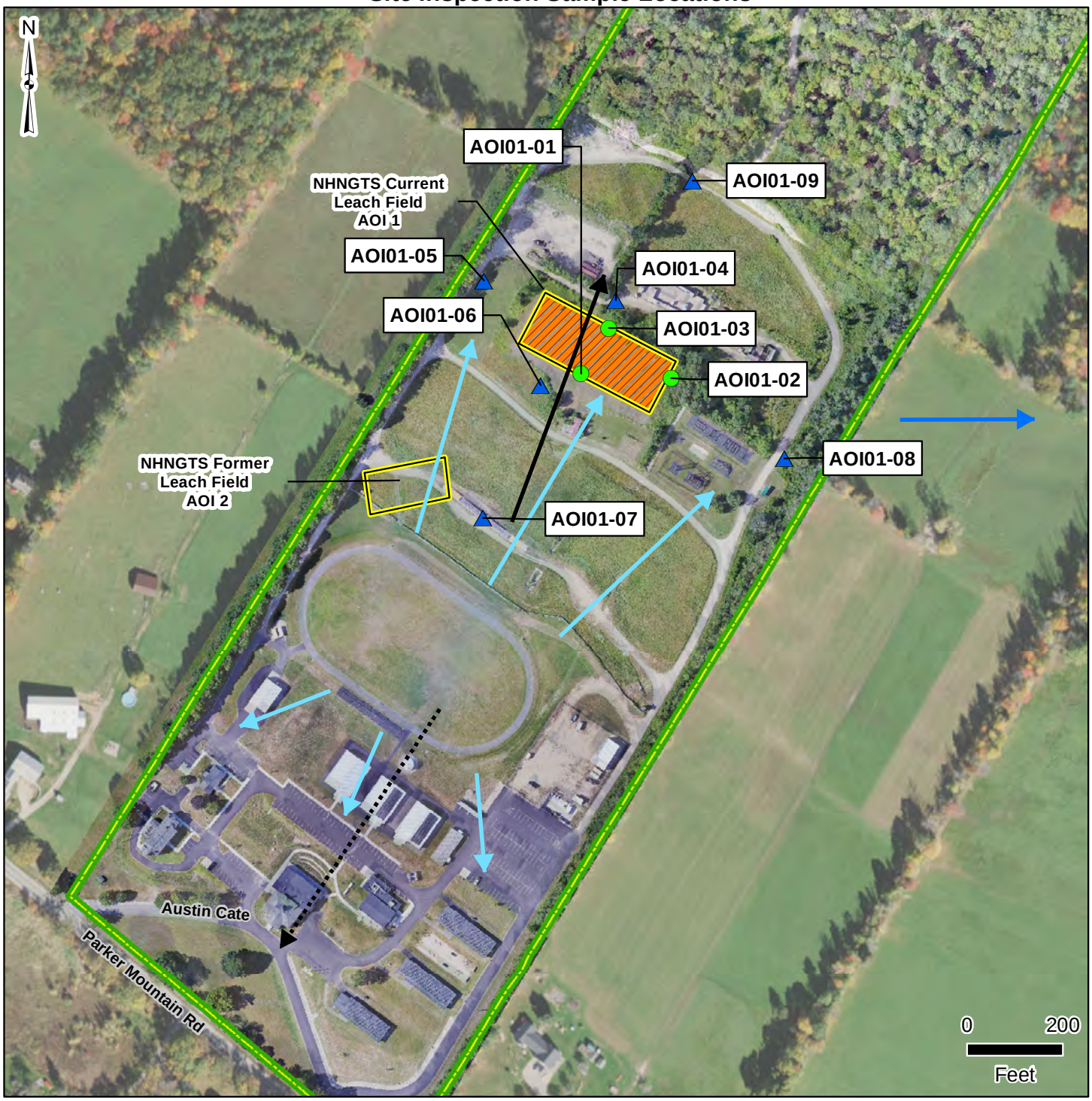


Figure 5-1
Site Inspection Sample Locations



Facility Data
- Area of Interest
- Potential PFAS Release
- Facility Boundary

Sample Type
- Soil Boring
- Monitoring Well

Hydrology/Hydrogeology
- Local Groundwater Flow Direction
- Inferred Local Groundwater Flow Direction
- Regional Groundwater Flow Direction
- Surface Water Flow Direction
- Water Body
- Wetland

Note: Certain features digitized from georeferenced AECOM Preliminary Assessment Report (2020) figures.

Date:.....September 2022
Prepared By:.....WSP
Prepared For:.....USACE

Document Path: P:\Army National Guard PFAS Maps\Strafford National Guard Training Site\Strafford National Guard Training SiteMXDs\Site Inspection Report\Figure 5-1 Site Inspection Sample Locations.mxd

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6. SITE INSPECTION RESULTS

This section presents the analytical results of the SI. The SLs used in this evaluation are presented in **Section 6.1** and **Table 6-1**. A discussion of the results for the AOI is provided in **Section 6.3**. **Tables 6-2** through **6-5** present results in soil or groundwater for the relevant compounds. Tables that contain all results are provided in **Appendix F**, and the laboratory reports are provided in **Appendix G**.

6.1 SCREENING LEVELS

The SLs established in the OSD memorandum apply to the five compounds presented on **Table 6-1**.

Table 6-1. Screening Levels (Soil and Groundwater)

Analyte[1,2]	Residential 0-2 ft bgs (Soil) (µg/kg)[1]	Industrial / Commercial Composite Worker 2-15 ft bgs (Soil) (µg /kg) [1]	Tap Water (Groundwater) (ng/L) [1]
PFOA	19	250	6
PFOS	13	160	4
PFBS	1,900	25,000	601
PFHxS	130	1,600	39
PFNA	19	250	6

Notes:
1. Assistant Secretary of Defense. July 2022. Risk Based Screening Levels in Groundwater and Soil using U.S. Environmental Protection Agency's (EPA's) Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. May 2022.
2. Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the CSM developed during the PA and revised based on SI findings, the presence of HFPO-DA is not anticipated at the facility because HFPO-DA is generally not a component of military specification MIL-SPEC AFFF and based on its history including distribution limitations that restricted use of GenX, it is generally not a component of other products the military used. In addition, it is unlikely that GenX would be an individual chemical of concern in the absence of other PFAS

Abbreviations:
µg/kg = microgram(s) per kilogram
bgs = below ground surface
ng/L = nanogram(s) per liter

The data in the subsequent sections are compared against the SLs presented in **Table 6-1**. The SLs for groundwater are based on direct ingestion. The SLs for soil are based on incidental ingestion and are applied to the depth intervals reasonably anticipated to be encountered by the receptors identified at the Facility: the residential scenario is applied to surface soil results (0 to 2 ft bgs) and the industrial/commercial worker scenario is applied to shallow subsurface soil results (2 to 15 ft bgs). The SLs are not applied to deep subsurface soil results (>15 ft bgs) because 15 ft is the anticipated limit of construction activities.

6.2 SOIL PHYSICOCHEMICAL ANALYSES

To provide basic soil parameter information, soil samples were analyzed for TOC, pH, and grain size, which are important for evaluating transport through the soil medium. **Appendix E** contains the results of the TOC, pH, and grain size sampling.

The data collected in this investigation will be used in subsequent investigations, where appropriate, to assess fate and transport. According to the ITRC, several important PFAS partitioning mechanisms include hydrophobic and lipophobic effects, electrostatic interactions, and interfacial behaviors. At relevant environmental pH values, certain PFAS are present as organic anions, and are therefore relatively mobile in groundwater (Xiao et al., 2015) but tend to associate with the organic carbon fraction that may be present in soil or sediment (Higgins and Luthy, 2006; Guelfo and Higgins, 2013). When sufficient organic carbon is present, organic carbon normalized distribution coefficients (K_{oc} values) can help in evaluating transport potential, though other geochemical factors (for example, pH and presence of polyvalent cations) may also affect PFAS sorption to solid phases (ITRC, 2018).

6.3 AOI 1 – CURRENT LEACH FIELD

This section presents the analytical results for soil and groundwater in comparison to SLs for AOI 1: Current Leach Field. The soil and groundwater results are summarized in **Table 6-2** through **Table 6-5**. Soil and groundwater results are presented on **Figures 6-1** through **Figure 6-7**.

This section also presents the analytical results for groundwater in comparison to SLs for locations AOI01-06 and AOI01-07, which were located upgradient of AOI 1. The purpose of these locations was to determine if there were potential sources upgradient of AOI 1. AOI01-07 is situated just below the ridge (topographic high) that separates the Facility into two drainage areas, whereas AOI01-06 is located closer to AOI 1.

6.3.1 AOI 1 Soil Analytical Results

Soil samples were collected from three boring locations associated with AOI 1 during the SI. **Figure 6-1** through **Figure 6-3** show the ranges of detections in soil in figure format. **Tables 6-2** through **Table 6-4** summarize the soil results in table format.

Three borings were installed as close as possible to the leach field (AOI01-01, AOI01-02, and AOI01-03). Shallow subsurface soil samples were collected at the approximate depth of the wastewater distribution box (3 to 5 ft bgs). A midpoint subsurface soil sample was collected at the midpoint between the ground surface and the groundwater table (5 to 7 ft bgs) at AOI01-01. Due to the shallow groundwater at locations AOI01-02 and AOI01-03, no midpoint subsurface soil samples were collected at those locations. Deep subsurface soil samples were collected approximately 1 ft above the groundwater table (5 to 9 ft bgs).

There were no exceedances of screening levels in shallow soils (3 to 5 ft bgs), midpoint soils (5 to 7 ft bg), or deeper soils (5 to 9 ft bgs).

PFOA was detected in shallow subsurface soil at one of three locations at a concentration of 0.23 J µg/kg (AOI01-01). PFOS, PFBS, PFNA, and PFHxS were not detected in the shallow subsurface soil samples.

PFOS, PFOA, PFBS, PFNA, and PFHxS were not detected in the midpoint subsurface soil sample taken at AOI01-01.

PFOS, PFOA, PFBS, PFNA, and PFHxS were not detected in the deep subsurface soil samples.

6.3.2 AOI 1 Groundwater

Only one AOI 1 groundwater sample had an exceedance of a screening level. The upgradient sample location positioned furthest from the leach field (AOI01-07), shown in **Figure 6-6**, exceeded the screening level for one constituent, PFOA, at 6.1 J+ ng/L, suggesting a release unrelated to the AOI 1.

6.3.2.1 AOI 1 – Current Leach Field Groundwater Analytical Results

Groundwater samples were collected from four temporary wells associated with AOI 1 during the SI (AOI01-04, AOI01-05, AOI01-08, and AOI01-09). Synoptic water level measurements taken in the temporary monitoring wells during the SI indicate that groundwater flows towards the northeast in the area of the leach field. Groundwater samples were collected from two locations downgradient of AOI 1; AOI01-04 and AOI01-09, with a duplicate sample collected at AOI01-09. Two groundwater samples were collected at locations cross-gradient of AOI 1; AOI01-05 and AOI01-08. **Figure 6-4** through **Figure 6-7** shows the ranges of detections in groundwater in figure format. **Table 6-5** summarizes the groundwater results in table format.

PFOA and PFOS were detected at concentrations below their respective SLs in groundwater samples taken downgradient and cross-gradient of AOI 1. PFOA was detected in groundwater in three of the four locations (AOI01-05, AOI01-08, and AOI01-09), with concentrations ranging from 1.8 J+ to 4.9 J ng/L. PFOS was detected in groundwater at one of four locations (AOI01-04), with a concentration of 3.3 J+ ng/L. PFHxS, PFBS, and PFNA were not detected in groundwater.

6.3.2.2 AOI 1 - Upgradient Source Area Groundwater Analytical Results

Two groundwater samples were collected upgradient of AOI 1: AOI01-06 and AOI01-07. PFOA was detected in groundwater with a concentration exceeding the SL at the most upgradient location (AOI01-07) at a concentration of 6.1 J+ ng/L. PFBS was also detected in groundwater at AOI01-07 below the SL, with a concentration of 2.0 J+ ng/L. PFOA and PFOS were detected at concentrations below their respective SLs in groundwater at AOI01-06. PFOA was detected in groundwater at AOI01-06 with a concentration of 3.9 J+ ng/L, and PFOS was detected in groundwater at AOI01-06 with concentration of 2.9 J+ ng/L. PFOS was not detected in groundwater at AOI01-07. PFHxS and PFNA were not detected in either of the upgradient groundwater samples. The detections in the groundwater at locations upgradient of AOI 1 may be related to the former leach field (AOI 2, see **Section 6.4**) an unidentified on-Facility source,

or a potential off-Facility source not under control of ARNG. Potential upgradient sources will be investigated as part of the RI.

6.3.3 Conclusions

PFOA and PFOS were detected in groundwater below their respective SLs at temporary monitoring well locations down-gradient and cross-gradient of AOI 1. While no soil samples exceeded the SLs, PFOA was detected in one shallow subsurface soil sample taken from as close as possible to the leach field (AOI01-01). Based on these results, no further action is warranted for AOI 1.

Two groundwater samples were collected upgradient of AOI 1: AOI01-06 and AOI01-07. PFOA was detected in groundwater with a concentration exceeding the SL at the most upgradient location (AOI01-07). The detections in the groundwater at locations upgradient of AOI 1 may be related to the former leach field (AOI 2, see **Section 6.4**), an unidentified on-Facility source, or a potential off-Facility source not under control of ARNG. Potential upgradient sources will be investigated as part of the RI. Based on these results, further evaluation is warranted for the area upgradient of AOI 1 in an RI.

6.4 AOI 2 – FORMER LEACH FIELD

Following the SI fieldwork, information was provided by NHARNG indicating that the current leach field had not been constructed in the location of the former leach, as was previously noted in the PA. The former leach field was located southwest and upgradient of the current leach field. Investigation of AOI 2 was not conducted during the SI and will be investigated as part of the RI.

Table 6-2
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Shallow Subsurface Soil
Site Inspection Report
New Hampshire National Guard Training Site

Area of Interest		AOI01							
Location ID		AOI01-01		AOI01-01-Duplicate		AOI01-02		AOI01-03	
Sample ID		AOI01-01-SB-(3-5)		DUP-02		AOI01-02-SB-(3-5)		AOI01-03-SB-(3-5)	
Sample Date		5/17/2022		5/17/2022		5/10/2022		5/10/2022	
Depth		3 - 5 ft		3 - 5 ft		3 - 5 ft		3 -5 ft	
Analyte	**OSD Screening Level [1]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Soil, PFAS by LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)									
PFBS	25000	ND	U	ND	U	ND	U	ND	U
PFHxS	1600	ND	U	ND	U	ND	U	ND	U
PFNA	250	ND	U	ND	UJ	ND	U	ND	U
PFOA	250	0.23	J	ND	UJ	ND	U	ND	U
PFOS	160	ND	U	ND	U	ND	U	ND	U

Notes

Gray Fill — Detected concentration exceeded OSD Screening Levels

References

1. Assistant Secretary of Defense, July 2022. *Risk Based Screening Levels Calculated for PFOA, PFOS, PFBS, PFHxS, and PFNA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1. May 2022.* The screening levels for soil are based on Industrial/Commercial Composite Worker scenario for direct ingestion of contaminated soil.

Chemical Abbreviations

PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

Interpreted Qualifiers

J = The result is an estimated quantity.
U = The analyte was not detected at a level greater than or equal to the adjusted DL.
UJ = The analyte was not detected at a level greater than or equal to the adjusted DL.
However, the reported adjusted DL is approximate and may be inaccurate or imprecise.

Acronyms and Abbreviations

µg/kg	microgram(s) per kilogram
AOI	Area of Interest
DUP	duplicate
HQ	Hazard Quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
LOQ	limit of quantitation
ND	analyte not detected above the LOD (LOD values are presented in Appendix F)
NHNGTS	New Hampshire National Guard Training Site
OSD	Office of the Secretary of the Defense
QSM	Quality Systems Manual
PFAS	per- and polyfluoroalkyl substances
SB	soil boring
USEPA	United States Environmental Protection Agency
Qual	interpreted qualifier

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Table 6-3
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Midpoint Subsurface Soil
Site Inspection Report
New Hampshire National Guard Training Site

	Area of Interest	AOI01	
	Location ID	AOI01-01	
	Sample ID	AOI01-01-SB-(5-7)	
	Sample Date	5/17/2022	
	Depth	5 - 7 ft	
Analyte	**OSD Screening Level [1]**	**Result**	**Qual**
Soil, PFAS by LCMSMS compliant with QSM 5.3 Table			
PFBS	25000	ND	U
PFHxS	1600	ND	U
PFNA	250	ND	UJ
PFOA	250	ND	UJ
PFOS	160	ND	U

Notes

Gray Fill — Detected concentration exceeded OSD Screening Levels

References

1. Assistant Secretary of Defense, July 2022. *Risk Based Screening Levels Calculated for PFOA, PFOS, PFBS, PFHxS, and PFNA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1. May 2022.* The screening levels for soil are based on Industrial/Commercial Composite Worker scenario for direct ingestion of contaminated soil.

Interpreted Qualifiers

U = The analyte was not detected at a level greater than or equal to the adjusted DL.

UJ = The analyte was not detected at a level greater than or equal to the adjusted DL. However, the reported adjusted DL is approximate and may be inaccurate or imprecise.

Chemical Abbreviations

PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

Acronyms and Abbreviations

µg/kg	microgram(s) per kilogram
AOI	Area of Interest
DUP	duplicate
HQ	Hazard Quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
LOQ	limit of quantitation
ND	analyte not detected above the LOD (LOD values are presented in Appendix F)
NHNGTS	New Hampshire National Guard Training Site
OSD	Office of the Secretary of the Defense
QSM	Quality Systems Manual
PFAS	per- and polyfluoroalkyl substances
SB	soil boring
USEPA	United States Environmental Protection Agency
Qual	interpreted qualifier

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Table 6-4
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Deep Subsurface Soil
Site Inspection Report
New Hampshire National Guard Training Site

	Area of Interest	AOI01					
	Location ID	AOI01-01		AOI01-02		AOI01-03	
	Sample ID	AOI01-01-SB-(7-9)		AOI01-02-SB-(5-9)		AOI01-03-SB-(5-8)	
	Sample Date	5/17/2022		5/14/2022		5/10/2022	
	Depth	7 - 9 ft		5 - 9 ft		5 - 8 ft	
Analyte	**OSD Screening Level [1]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Soil, PFAS by LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)							
PFBS	25000	ND	U	ND	U	ND	U
PFHxS	1600	ND	U	ND	U	ND	U
PFNA	250	ND	UJ	ND	U	ND	U
PFOA	250	ND	UJ	ND	U	ND	U
PFOS	160	ND	U	ND	U	ND	U

Notes

Gray Fill — Detected concentration exceeded OSD Screening Levels

References

1. Assistant Secretary of Defense, July 2022. *Risk Based Screening Levels Calculated for PFOA, PFOS, PFBS, PFHxS, and PFNA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1. May 2022.* The screening levels for soil are based on Industrial/Commercial Composite Worker scenario for direct ingestion of contaminated soil.

Chemical Abbreviations

PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

Interpreted Qualifiers

U = The analyte was not detected at a level greater than or equal to the adjusted DL.
UJ = The analyte was not detected at a level greater than or equal to the adjusted DL.
However, the reported adjusted DL is approximate and may be inaccurate or imprecise.

Acronyms and Abbreviations

µg/kg	microgram(s) per kilogram
AOI	Area of Interest
DUP	duplicate
HQ	Hazard Quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
LOQ	limit of quantitation
ND	analyte not detected above the LOD (LOD values are presented in Appendix F)
NHNGTS	New Hampshire National Guard Training Site
OSD	Office of the Secretary of the Defense
QSM	Quality Systems Manual
PFAS	per- and polyfluoroalkyl substances
SB	soil boring
USEPA	United States Environmental Protection Agency
Qual	interpreted qualifier

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Table 6-5
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Groundwater
Site Inspection Report
New Hampshire National Guard Training Site

Area of Interest		AOI01													
Location ID		AOI01-04		AOI01-05		AOI01-06		AOI01-07		AOI01-08		AOI01-09		AOI01-09-Duplicate	
Sample ID		AOI01-04-GW-(14)		AOI01-05-GW-(19)		AOI01-06-GW-(14)		AOI01-07-GW-(20)		AOI01-08-GW-(13)		AOI01-09-GW-(28)		DUP-01	
Sample Date		5/19/2022		5/17/2022		5/17/2022		5/13/2022		5/19/2022		5/12/2022		5/13/2022	
Analyte	**OSD Screening Level [1]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Water, PFAS by LCMSMS compliant with QSM 5.3 Table B-15 (ng/l)															
PFBS	601	ND	U	ND	U	ND	UJ	2.0	J+	ND	U	ND	UJ	ND	UJ
PFHxS	39	ND	U	ND	U	ND	UJ	ND	UJ	ND	U	ND	UJ	ND	U
PFNA	6	ND	U	ND	U	ND	UJ	ND	U	ND	U	ND	U	ND	U
PFOA	6	ND	U	3.4	J+	3.9	J+	6.1	J+	1.8	J+	4.0	J	4.9	J
PFOS	4	3.3	J+	ND	U	2.9	J+	ND	U	ND	U	ND	U	ND	U

Notes

Gray Fill — Detected concentration exceeded OSD Screening Levels

References

1. Assistant Secretary of Defense, July 2022. *Risk Based Screening Levels Calculated for PFOA, PFOS, PFBS, PFHxS, and PFNA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1* . May 2022. Groundwater screening levels based on residential scenario for direct ingestion of groundwater.

Interpreted Qualifiers

J = Estimated concentration.
U = The analyte was not detected at a level greater than or equal to the adjusted DL.
UJ = The analyte was not detected at a level greater than or equal to the adjusted DL. However, the reported adjusted DL is approximate and may be inaccurate or imprecise.

Chemical Abbreviations

PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

Acronyms and Abbreviations

AOI	Area of Interest
DUP	duplicate
HQ	Hazard Quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
LOQ	limit of quantitation
ND	analyte not detected above the LOD (LOD values are presented in Appendix F)
ng/L	New Hampshire National Guard Training Site
NHNGTS	nanogram(s) per liter
OSD	Office of the Secretary of the Defense
QSM	Quality Systems Manual
PFAS	per- and polyfluoroalkyl substances
SB	soil boring
USEPA	United States Environmental Protection Agency
Qual	interpreted qualifier

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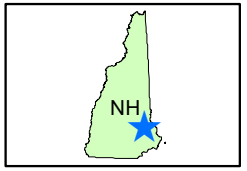
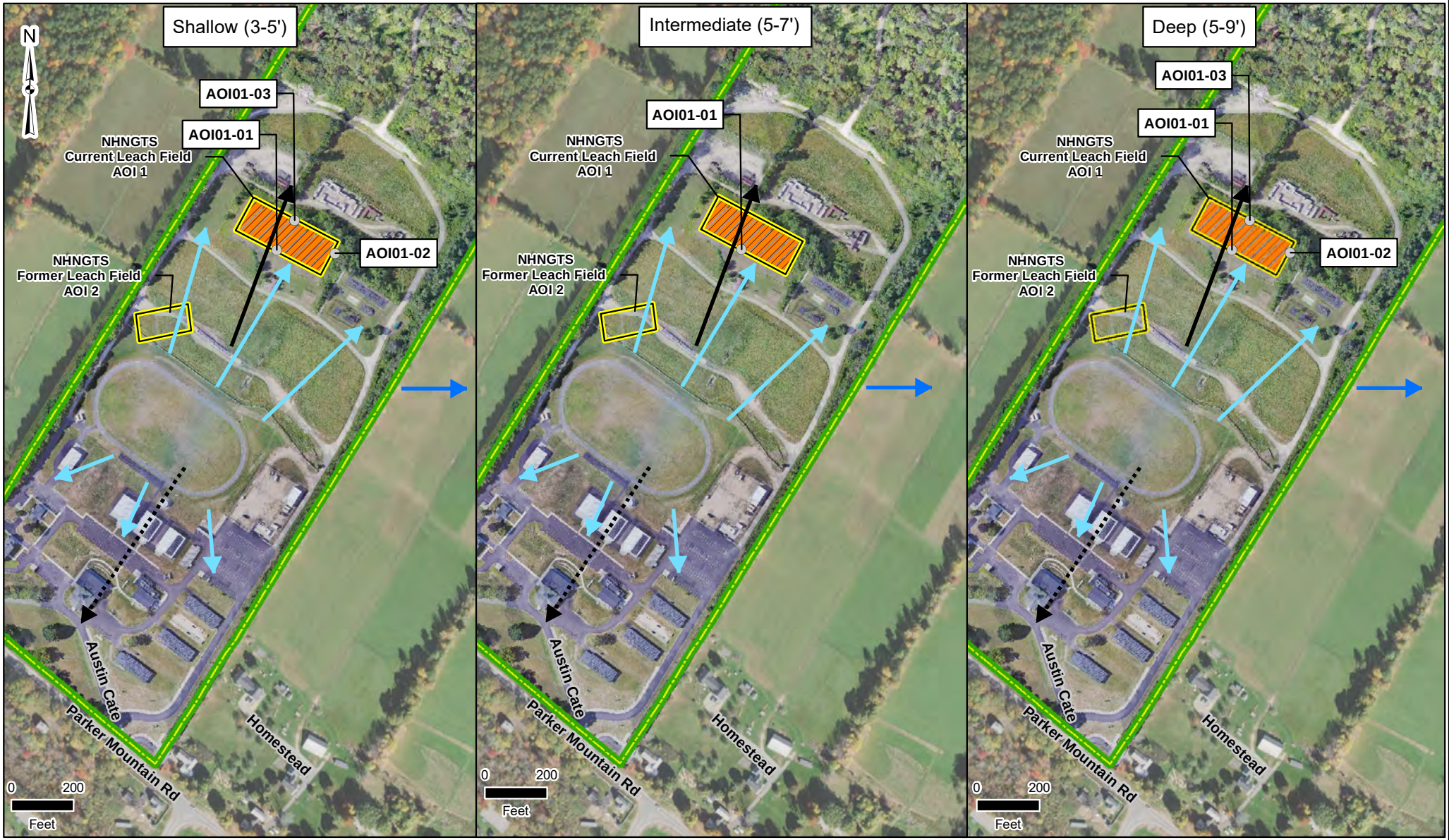
Army National Guard Site Inspections
Site Inspection Report
New Hampshire National Guard Training Site
Center Strafford, New Hampshire

Figure 6-1
PFOS Detections in Soil





Facility Data
- Area of Interest
- Potential PFAS Release
- Facility Boundary

Hydrology/Hydrogeology
- Local Groundwater Flow Direction
- Inferred Local Groundwater Flow Direction
- Regional Groundwater Flow Direction
- Surface Water Flow Direction

PFOS Results (µg/kg)
- ND (Non-Detect)
- >ND - 13
- >13 -160
- >160 - 1,600
- >1,600

NOTES:
PFAS - Per- and Polyfluoroalkyl Substances
PFOS = perfluorooctanesulfonic acid
ND = Non-Detect
(µg/Kg) = Microgram(s) per Kilogram
Exceedances of The Office of the Secretary of Defense (OSD) Screening Level (SL) are depicted with a yellow halo.

Data Sources:
ESRI 2020
AECOM 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE

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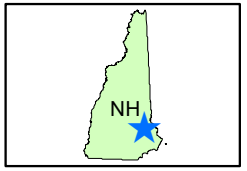
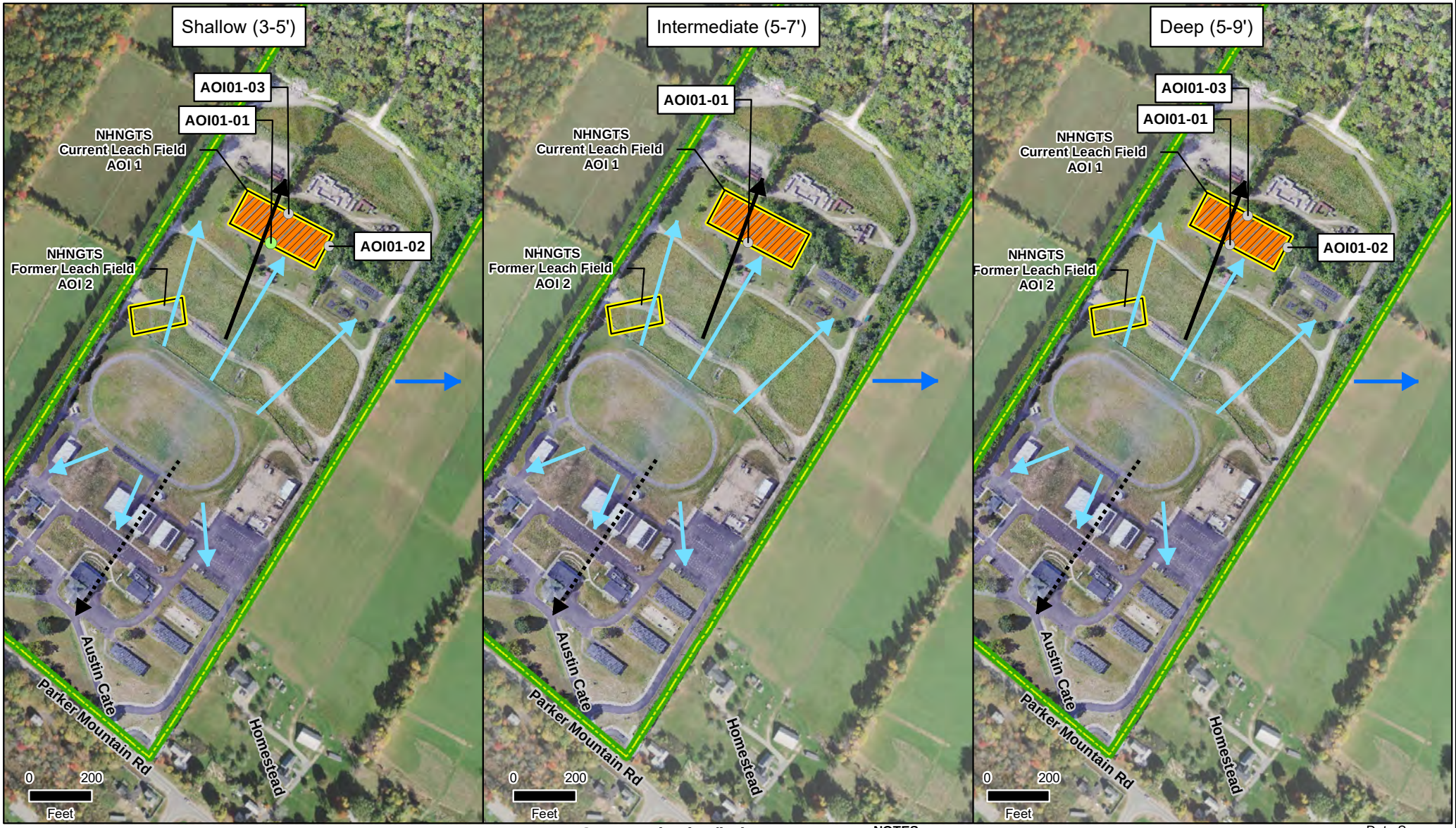
Army National Guard Site Inspections
Site Inspection Report
New Hampshire National Guard Training Site
Center Strafford, New Hampshire

Figure 6-2
PFOA Detections in Soil





Facility Data
- Area of Interest
- Potential PFAS Release
- Facility Boundary

Hydrology/Hydrogeology
- Local Groundwater Flow Direction
- Inferred Local Groundwater Flow Direction
- Regional Groundwater Flow Direction
- Surface Water Flow Direction

PFOA Results (µg/kg)
- ND (Non-Detect)
- >ND - 19
- >19 - 250
- >250 - 2,500
- >2,500

NOTES:
PFAS = Per- and Polyfluoroalkyl Substances
PFOA = perfluorooctanoic acid
ND = Non-Detect
(µg/Kg) = Microgram(s) per Kilogram
Exceedances of The Office of the Secretary of Defense (OSD) Screening Level (SL) are depicted with a yellow halo.

Data Sources:
ESRI 2020
AECOM 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE

Document Path: P:\Army National Guard PFAS Maps\Strafford National Guard Training Site\Strafford National Guard Training Site\MXDs\Site Inspection Report\Figure 6-2 PFOA Detections in Soil.mxd

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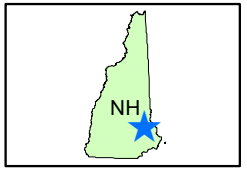
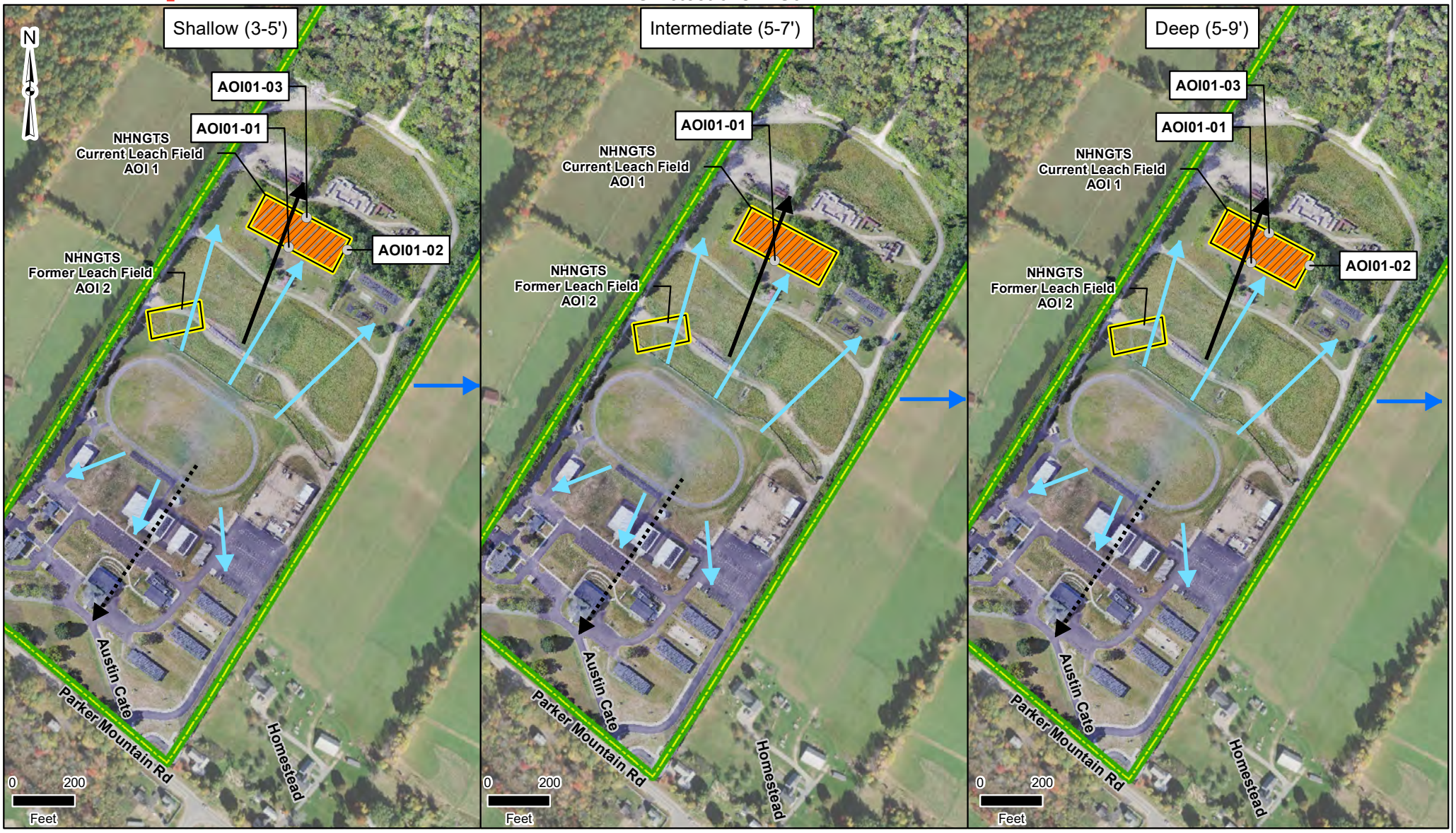
Army National Guard Site Inspections
Site Inspection Report
New Hampshire National Guard Training Site
Center Strafford, New Hampshire

Figure 6-3
PFBS Detections in Soil





Facility Data
- Area of Interest
- Potential PFAS Release
- Facility Boundary

Hydrology/Hydrogeology
- Local Groundwater Flow Direction
- Inferred Local Groundwater Flow Direction
- Regional Groundwater Flow Direction
- Surface Water Flow Direction

PFBS Results (µg/kg)
- ND (Non-Detect)
- >ND - 10
- >10 - 1,900
- >1,900 - 25,000
- >25,000

NOTES:
PFAS = Per- and Polyfluoroalkyl Substances
PFBS = perfluorobutanesulfonic acid
ND = Non-Detect
(µg/Kg) = Microgram(s) per Kilogram
Exceedances of The Office of the Secretary of Defense (OSD) Screening Level (SL) are depicted with a yellow halo.

Data Sources:
ESRI 2020
AECOM 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE

Document Path: P:\Army National Guard PFAS Maps\Strafford National Guard Training Site\Strafford National Guard Training SiteMXDs\Site Inspection Report\Figure 6-3 PFBS Detections in Soil (AOI 1).mxd

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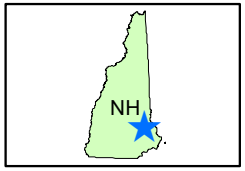
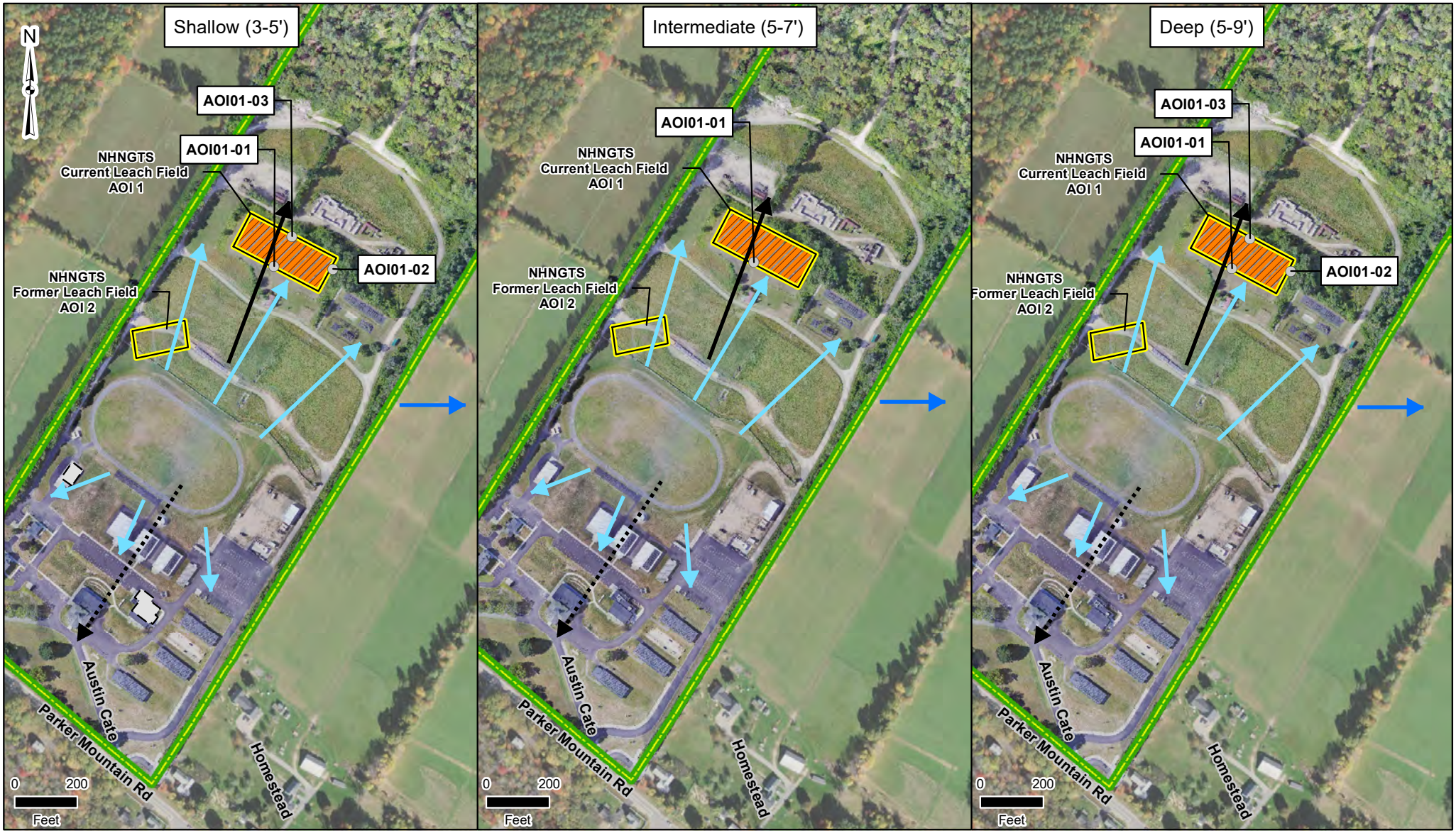
Army National Guard Site Inspections
Site Inspection Report
New Hampshire National Guard Training Site
Center Strafford, New Hampshire

Figure 6-4
PFHxS Detections in Soil





Facility Data
- Area of Interest
- Potential PFAS Release
- Facility Boundary

Hydrology/Hydrogeology
- Local Groundwater Flow Direction
- Inferred Local Groundwater Flow Direction
- Regional Groundwater Flow Direction
- Surface Water Flow Direction

PFHxS Results (µg/kg)
- ND (Non-Detect)
- >ND - 13
- >13 -160
- >160 - 1,600
- >1,600

NOTES:
PFAS - Per- and Polyfluoroalkyl Substances
PFHxS = perfluorohexanesulfonic acid
ND = Non-Detect
(µg/Kg) = Microgram(s) per Kilogram
Exceedances of The Office of the Secretary of Defense (OSD) Screening Level (SL) are depicted with a yellow halo.

Data Sources:
ESRI 2020
AECOM 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE

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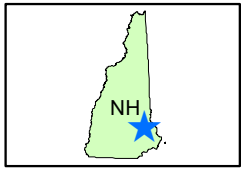
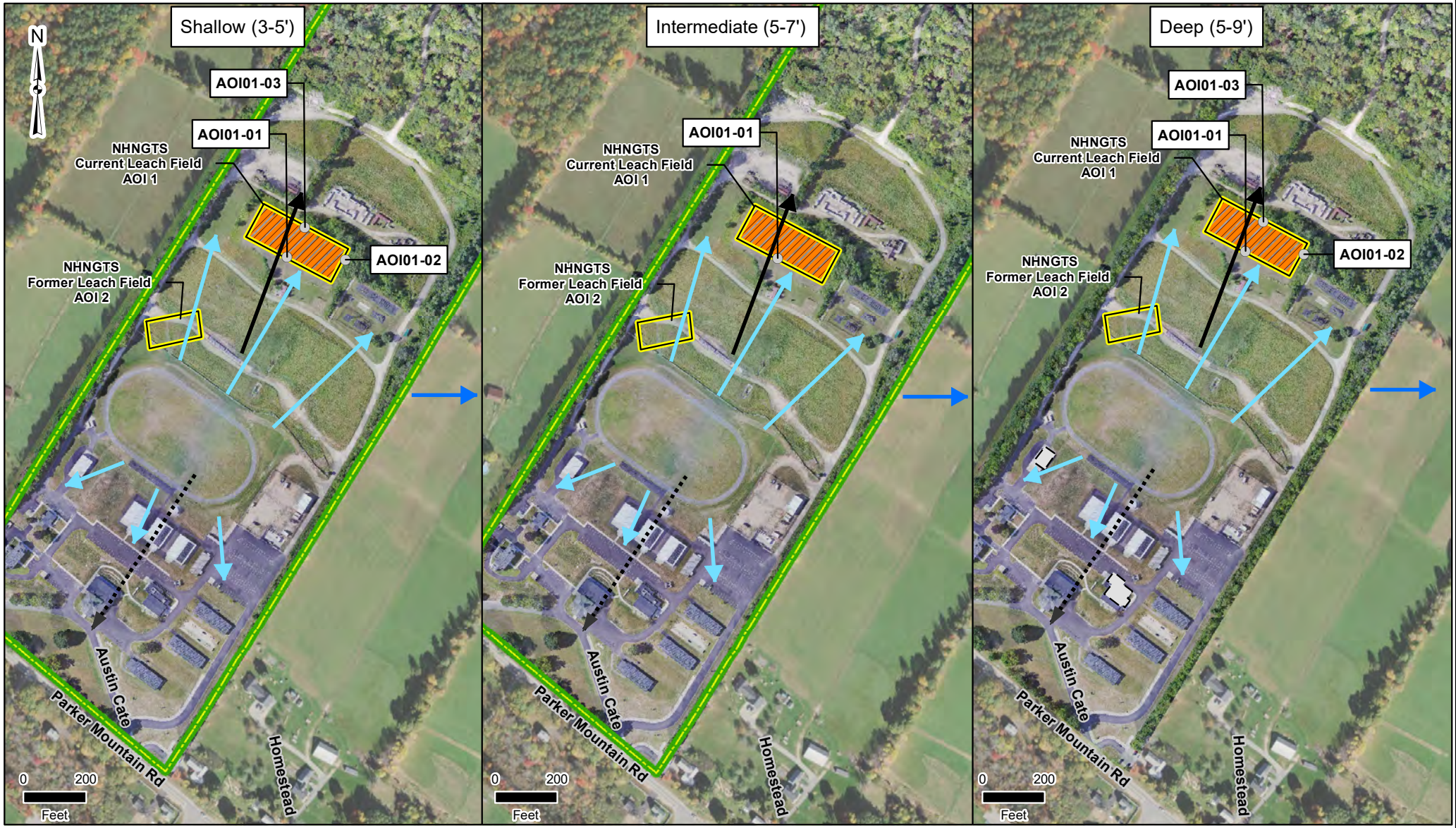
Army National Guard Site Inspections
Site Inspection Report
New Hampshire National Guard Training Site
Center Strafford, New Hampshire

Figure 6-5
PFNA Detections in Soil





Facility Data
- Area of Interest
- Potential PFAS Release
- Facility Boundary

Hydrology/Hydrogeology
- Local Groundwater Flow Direction
- Inferred Local Groundwater Flow Direction
- Regional Groundwater Flow Direction
- Surface Water Flow Direction

PFNA Results (µg/kg)
- ND (Non-Detect)
- >ND - 19
- >19 - 250
- >250 - 2,500
- >2,500

NOTES:
PFAS - Per- and Polyfluoroalkyl Substances
PFNA = perfluorononanoic acid
ND = Non-Detect
(µg/Kg) = Microgram(s) per Kilogram
Exceedances of The Office of the Secretary of Defense (OSD) Screening Level (SL) are depicted with a yellow halo.

Data Sources:
ESRI 2020
AECOM 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE

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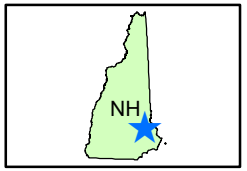
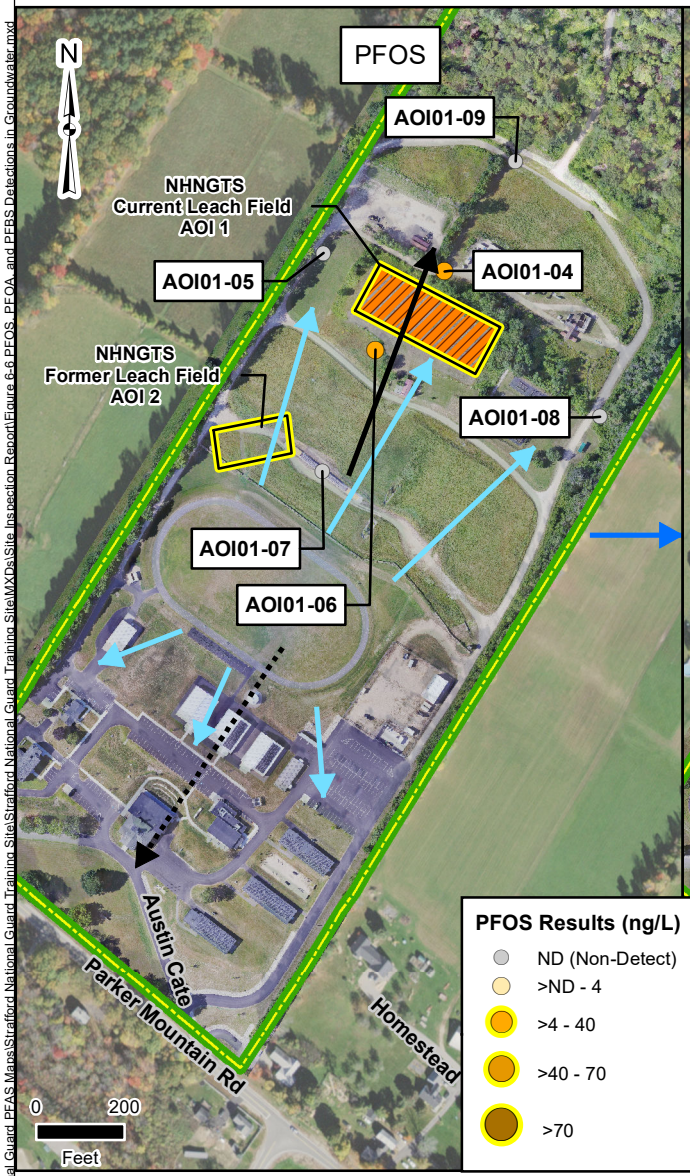
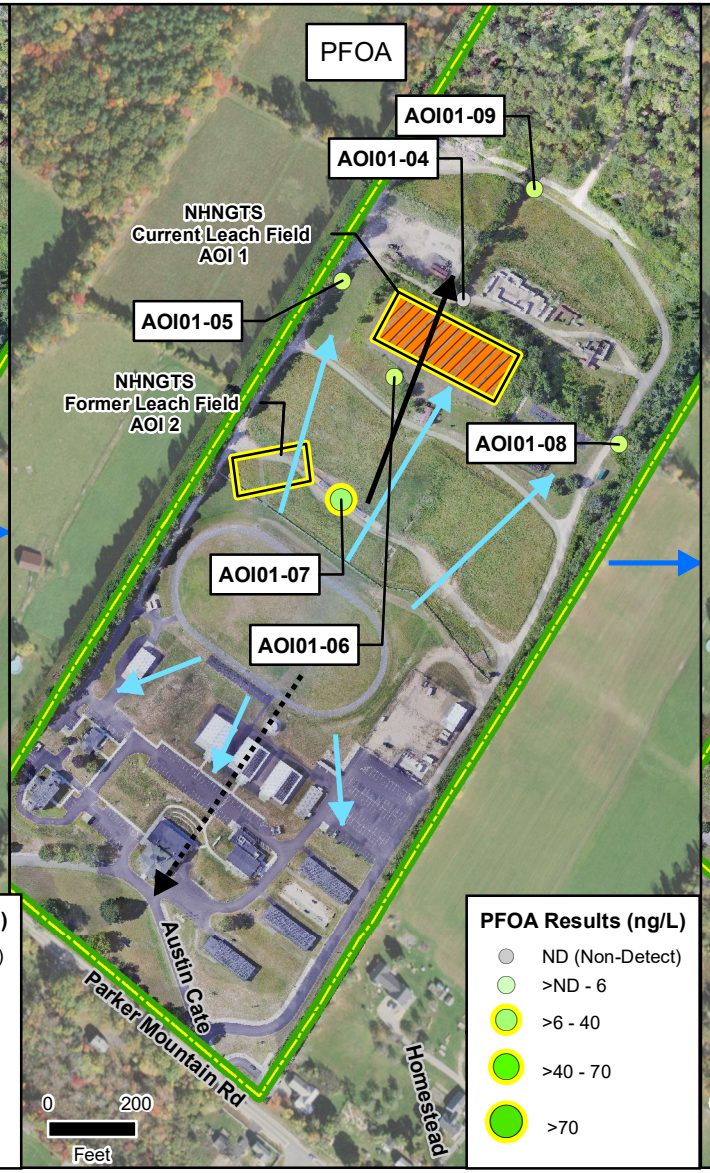
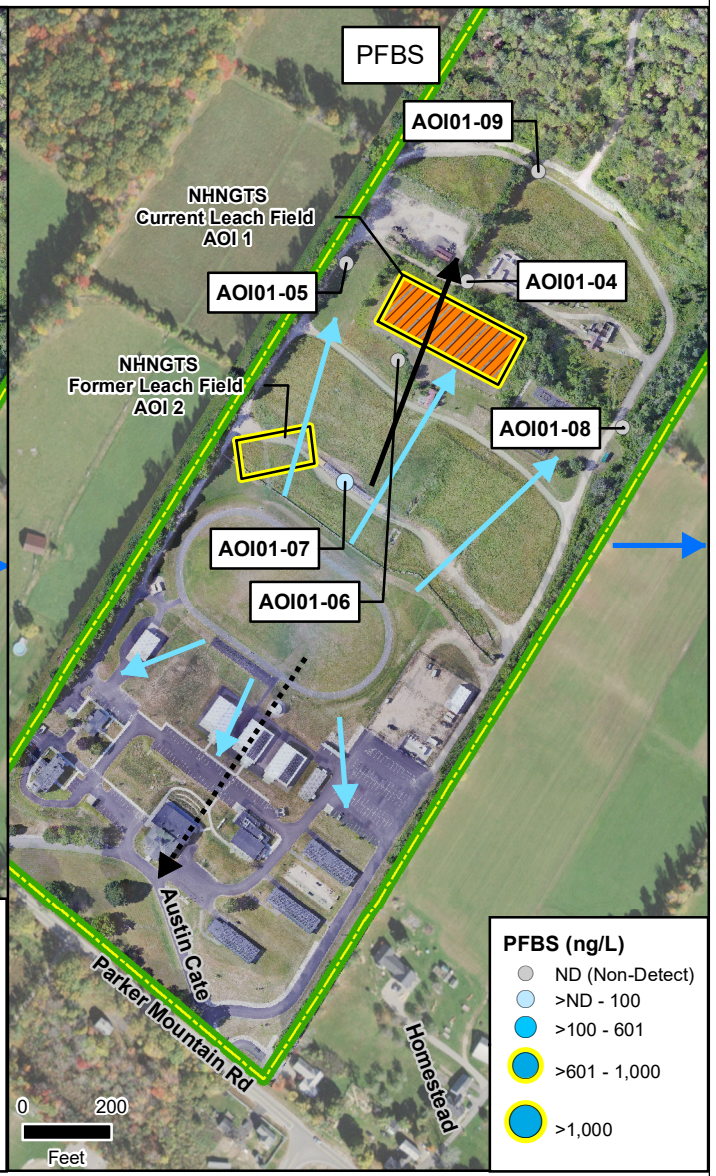
Army National Guard Site Inspections
Site Inspection Report
New Hampshire National Guard Training Site
Center Strafford, New Hampshire

Figure 6-6
PFOS, PFOA, and PFBS Detections in Groundwater









Facility Data
- Area of Interest
- Potential PFAS Release
- Facility Boundary

Hydrology/Hydrogeology
- Local Groundwater Flow Direction
- Inferred Local Groundwater Flow Direction
- Regional Groundwater Flow Direction
- Surface Water Flow Direction

NOTES:
PFAS - Per- and Polyfluoroalkyl Substances
PFOS = perfluorooctanesulfonic acid
PFOA = perfluorooctanoic acid
PFBS = perfluorobutanesulfonic acid
ND = Non-Detect
ng/L = nanogram(s) per liter
Exceedances of The Office of the Secretary of Defense (OSD) Screening Level (SL) are depicted with a yellow halo.

Data Sources:
ESRI 2020
AECOM 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE

Document Path: P:\Army National Guard PFAS Maps\Strafford National Guard Training Site\Strafford National Guard Training Site\MXDs\Site Inspection Report\Figure 6-6 PFOS, PFOA, and PFBS Detections in Groundwater.mxd

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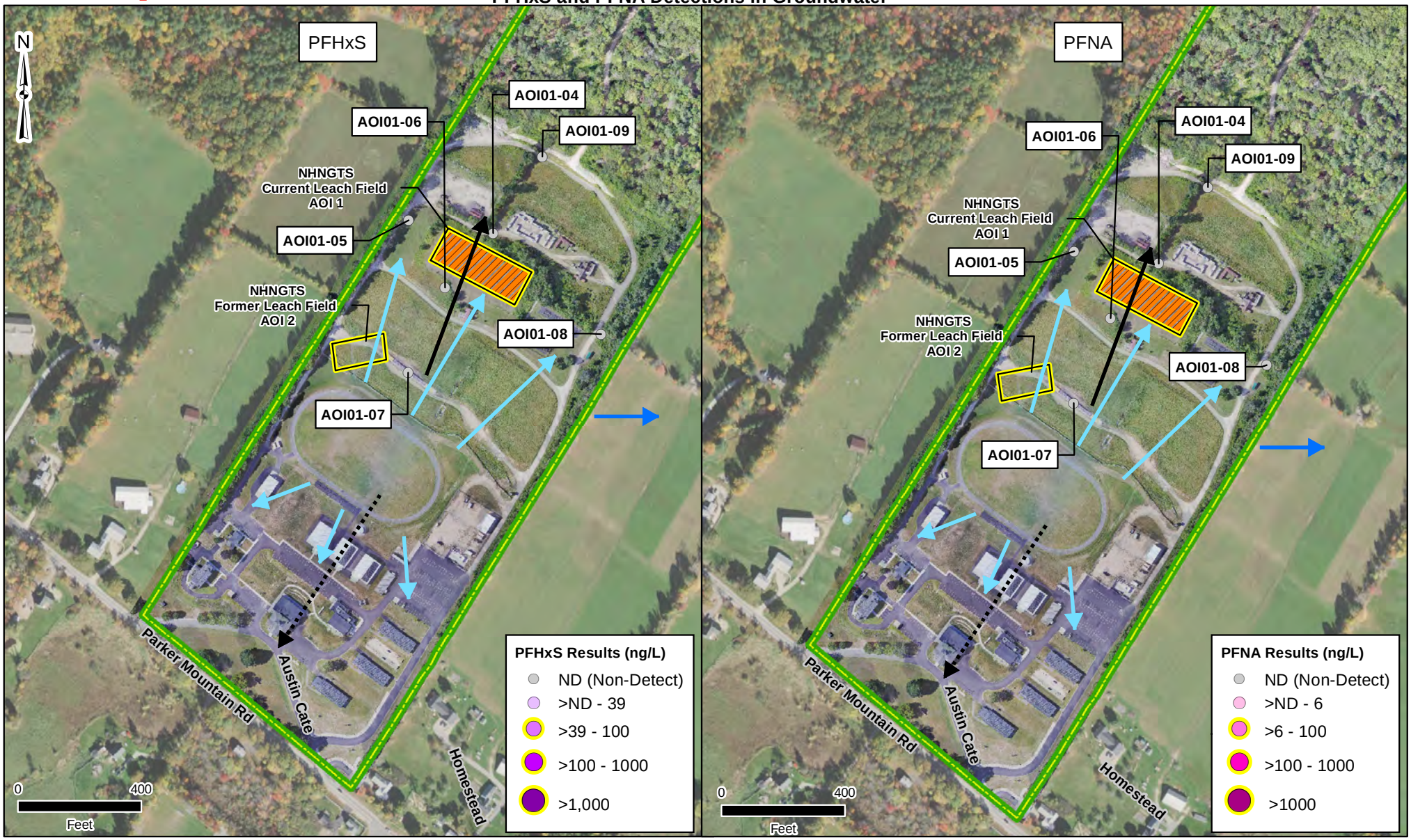
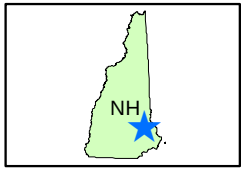
Army National Guard Site Inspections
Site Inspection Report
New Hampshire National Guard Training Site
Center Strafford, New Hampshire

Figure 6-7
PFHxS and PFNA Detections in Groundwater





Facility Data
- Area of Interest
- Potential PFAS Release
- Facility Boundary

Hydrology/Hydrogeology
- Local Groundwater Flow Direction
- Inferred Local Groundwater Flow Direction
- Regional Groundwater Flow Direction
- Surface Water Flow Direction

NOTES:
PFAS - Per-and Polyfluoroalkyl Substances
PFHxS = Perfluorohexanesulfonic acid
PFNA = Perfluorononanoic acid
ND = Non-Detect
ng/L = nanogram(s) per liter
Exceedances of The Office of the Secretary of Defense (OSD) Screening Level (SL) are depicted with a yellow halo.

Data Sources:
ESRI 2020
AECOM 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE

Document Path: P:\Army National Guard PFAS Maps\Strafford National Guard Training Site\Strafford National Guard Training SiteMXDs\Site Inspection Report\Figure 6-7 PFHxS and PFNA Detections in Groundwater.mxd

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7. EXPOSURE PATHWAYS

The Conceptual Site Model (CSM) for AOI 1, revised based on the SI findings, is presented on **Figure 7-1**. Additionally, preliminary CSMs for a potentially unidentified upgradient source (**Figure 7-2**) and for AOI 2 are included (**Figure 7-3**).

Please note that while the CSM discussion assists in determining if a receptor may be impacted, the decision to move from SI to RI or interim action is determined based upon exceedances of the SLs for the relevant compounds and whether the release is more than likely attributable to the DoD. A CSM presents the current understanding of the Facility conditions with respect to known and suspected sources, potential transport mechanisms and migration pathways, and potentially exposed human receptors. A human exposure pathway is considered potentially complete when the following conditions are present:

1. Contaminant source;
2. Environmental fate and transport;
3. Exposure point;
4. Exposure route; and
5. Potentially exposed populations.

If any of these elements are missing, the pathway is incomplete. The CSM figures use an empty circle symbol to represent an incomplete exposure pathway. Areas with no identified complete pathway generally warrant no further action. However, the pathway is considered potentially complete if the relevant compounds are detected, in which case the CSM figure uses a half-filled circle symbol to represent a potentially complete exposure pathway. Additionally, a completely filled circle symbol is used to indicate when a potentially complete exposure pathway has detections of the relevant compounds above the SLs. Areas with an identified potentially complete pathway and a complete pathway may warrant further investigation. Although the CSMs indicate whether potentially complete exposure pathways may exist, the recommendation for future study in a RI or no action at this time is based on the comparison of the SI analytical results for the relevant compounds to the SLs and whether the release is more than likely attributable to the DoD.

In general, the potential routes of exposure to the relevant compounds are ingestion and inhalation. Human exposure via the dermal contact pathway may occur, and current risk practice suggests it is an insignificant pathway compared to ingestion; however, exposure data for dermal pathways are sparse and continue to be the subject of toxicological study. The receptors evaluated are consistent with those listed in EPA guidance for risk screening (EPA 2001). Receptors at the Facility include Facility workers (e.g., Facility staff and visiting soldiers), construction workers, trespassers, recreational users, and off-Facility residents.

7.1 SOIL EXPOSURE PATHWAY

The SI results in soil were used to determine whether a potentially complete pathway exists between the source and potential receptors at each AOI based on the aforementioned criteria.

7.1.1 AOI 1 – Current Leach Field

AOI 1 is the current leach field. Liquids potentially containing PFAS were discharged to the wastewater system which flows to the current leach field. The piping for the leach field is below the ground surface; therefore, there is the potential for PFAS to have been released directly to the subsurface soil. Due to potential releases occurring only below the ground surface, no surface soil samples were collected as part of the SI. The human exposure pathway via surface soil is considered incomplete. PFOA was detected in soil just below the surface (3 to 5 ft bgs) at AOI 1. Construction workers could contact constituents in subsurface soil via incidental ingestion and inhalation of dust; therefore, the subsurface soil exposure pathway for construction workers is potentially complete. The CSM is presented in **Figure 7-1**.

7.1.1.1 AOI 1 – Upgradient Source Area

No soil samples were collected in the area upgradient of AOI 1. Due to the detection of PFOA in groundwater that exceeded the SL at a sample location upgradient of AOI 1, further assessment of the area upgradient of AOI 1 will be conducted during the RI. The detections in the groundwater at locations upgradient of AOI 1 may be related to the former leach field (AOI 2, see **Section 7.1.2**) an unidentified on-Facility source, or a potential off-Facility source not under control of ARNG. Further assessment of potential exposure pathways will be conducted during the RI. As the source is unknown, the surface soil exposure pathways are potentially complete for the Facility worker, construction worker, and recreational user/trespasser, and the soil exposure pathways is potentially complete for the construction worker. The preliminary CSM for a potential unidentified on-Facility source presented in **Figure 7-2**.

7.1.2 AOI 2 – Former Leach Field

AOI 2 is the former leach field. During preparation of the SI Report, it was discovered that the current leach field was not constructed in the same location as the former leach field. The former leach field was located southwest (and upgradient) of the current leach field and was not investigated as part of the SI. Following the SI, the former leach field was identified as a second AOI (AOI 2) due to the potential use of floor polish while it was in use. Liquids potentially containing PFAS were discharged to wastewater system which flowed to the former leach field. The piping for the former leach field was below the ground surface; therefore, there is the potential for PFAS to have been released directly to the subsurface soil. Due to potential releases occurring only below the ground surface, the human exposure pathway via surface soil is considered incomplete. Further assessment of potential exposure pathways will be conducted during the RI. The preliminary CSM for AOI 2 is presented in **Figure 7-3**.

7.2 GROUNDWATER EXPOSURE PATHWAY

The SI results in groundwater were used to determine whether a potentially complete pathway exists between the source and potential receptors at each AOI based on the aforementioned criteria.

7.2.1 AOI 1 – Current Leach Field

PFOS and PFOA were detected in the groundwater at AOI 1 at concentrations below their respective SLs. Due to these detections of PFOS and PFOA in wells associated with AOI 1 and the detections of PFAS in water samples taken from NHNGTS water supply wells (Well #1 and Well #4) in 2017 (see **Section 2.2.2**), the pathway for exposure to Facility workers is considered potentially complete. The concentration at the potential point of exposure for off-Facility residents is not known, therefore, the exposure pathway for ingestion is potentially complete for off-Facility residential receptors. Depths to groundwater measured at AOI 1 in May 2022 during the SI ranged from 7.93 to 17.18 ft bgs. Therefore, the ingestion exposure pathway for construction workers is considered potentially complete. It is unknown if recreational users are using the onsite water supply, therefore, the ingestion pathway for the recreational user is considered potentially compete. The CSM is presented on **Figure 7-1**.

7.2.1.1 AOI 1 – Upgradient Source Area

PFOA was detected in groundwater in both sample locations upgradient of AOI 1. The concentration of PFOA exceeded the SL at one upgradient location. PFOS and PFBS were both detected below their respective SL in the upgradient sample locations. These results, in conjunction with the Facility topography, may indicate a potential source upgradient of the current leach field. The detections in the groundwater at locations upgradient of AOI 1 may be related to the former leach field (AOI 2, see **Section 7.2.2**), an unidentified on-Facility source, or a potential off-Facility source not under control of ARNG.

Due to the detections of PFOA (exceeding the SL), PFOS, and PFBS (below their respective SLs) in wells located upgradient of AOI 1 and the detections of PFAS in water samples taken from NHNGTS water supply wells (Well #1 and Well #4) in 2017 (see **Section 2.2.2**), the pathway for exposure to Facility workers is considered potentially complete. The concentration at the potential point of exposure for off-Facility residents is not known, therefore, the exposure pathway for ingestion is potentially complete for off-Facility residential receptors. Depths to groundwater measured at AOI 1 in May 2022 during the SI ranged from 7.93 to 17.18 ft bgs. Therefore, the ingestion exposure pathway for future construction workers is considered potentially complete. It is unknown if recreational users are using the onsite water supply, therefore, the ingestion pathway for the recreational user is considered potentially compete. Further assessment will be conducted during the RI. The preliminary CSM is presented on **Figure 7-2**.

7.2.2 AOI 2 – Former Leach Field

Following the SI fieldwork, new information was provided by NHARNG indicating that the current leach field had not been constructed in the location of the former leach field, as was previously noted in the PA. The former leach field was located southwest and upgradient of the current leach field. Investigation of AOI 2 was not conducted during the SI and will be investigated as part of the RI.

Due to the detections of PFOA (exceeding the SL), PFOs, and PFBS (below their respective SLs) in wells located upgradient of AOI 1 and the detections of PFAS in water samples taken

from NHNGTS water supply wells (Well #1 and Well #4) in 2017 (see **Section 2.2.2**), the pathway for exposure to Facility workers is considered potentially complete. The concentration at the potential point of exposure for off-Facility residents is not known, therefore, the exposure pathway for ingestion is potentially complete for off-Facility residential receptors. Depths to groundwater measured at AOI 1 in May 2022 during the SI ranged from 7.93 to 17.18 ft bgs. Therefore, the ingestion exposure pathway for future construction workers is considered potentially complete. It is unknown if recreational users are using the onsite water supply, therefore, the ingestion pathway for the recreational user is considered potentially compete. Further assessment will be conducted during the RI. The preliminary CSM is presented on **Figure 7-3**.

7.3 SURFACE WATER AND SEDIMENT EXPOSURE PATHWAY

The elevation of the Mohawk River, located north of the Facility, is below the elevation of the surface of the groundwater near the Facility. Therefore, groundwater flow from the Facility is likely to flow into the Mohawk River. Additionally, several intermittent streams, originating as hillside seeps, also flow into the wetland system (on and off Facility) to the north. The ingestion exposure pathway for offsite surface water and sediment is considered potentially complete for recreational users of these rivers. Human consumption of fish potentially affected by PFAS from the rivers is also possible. No surface water or sediment samples were collected as part of the SI.

7.3.1 AOI 1 – Current Leach Field

PFOS and PFOA were detected in the groundwater at AOI 1 at concentrations below their respective SLs. As AOI 1 is located on the north portion of the Facility, groundwater may flow into the Mohawk River and expose the potential off-Facility recreational user of the river by ingestion of surface water and/or fish potentially affected by PFAS.

7.3.1.1 AOI 1 – Upgradient Source Area

PFOA was detected in groundwater in both sample locations upgradient of AOI 1. The concentration of PFOA exceeded the SL at one upgradient location. PFOS and PFBS were both detected below their respective SL in the upgradient sample locations. These results, in conjunction with the Facility topography, may indicate a potential source upgradient of the current leach field. The detections in the groundwater at locations upgradient of AOI 1 may be related to the former leach field (AOI 2, see **Section 7.3.2**), an unidentified on-Facility source, or a potential off-Facility source not under control of ARNG.

PFOA was detected in groundwater in both sample locations upgradient of AOI 1. The concentration of PFOA exceeded the SL at one upgradient location. PFOS and PFBS were both detected below their respective SL in the upgradient sample locations. As the area upgradient of AOI 1 is located on the north portion of the Facility, groundwater may flow into the Mohawk River and expose the potential off-Facility recreational user of the river by ingestion of surface water and/or fish potentially affected by PFAS.

7.3.2 AOI 2 – Former Leach Field

Following the SI fieldwork, new information was provided by NHARNG indicating that the current leach field had not been constructed in the location of the former leach field, as was previously noted in the PA. The former leach field was located southwest and upgradient of the current leach field. Investigation of AOI 2 was not conducted during the SI and will be investigated as part of the RI.

PFOA was detected in groundwater in both sample locations upgradient of AOI 1. The concentration of PFOA exceeded the SL at one upgradient location. PFOS and PFBS were both detected below their respective SL in the upgradient sample locations. As the area upgradient of AOI 1 is located on the north portion of the Facility, groundwater may flow into the Mohawk River and expose the potential off-Facility recreational user of the river by ingestion of surface water and/or fish potentially affected by PFAS.

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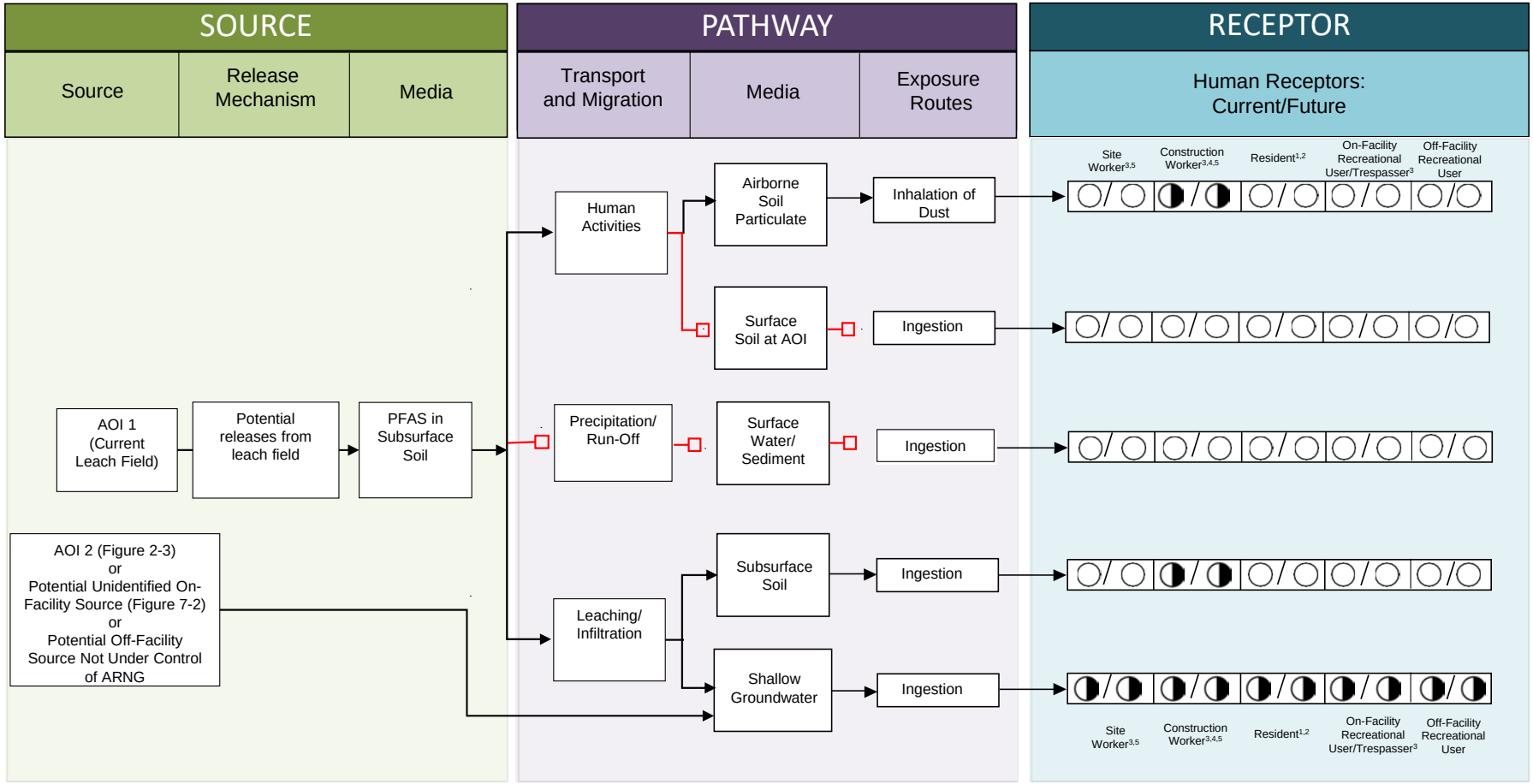

LEGEND

- Flow Chart Stops
- Flow Chart Continues
- Incomplete Pathway
- Potentially Complete Pathway
- Potentially Complete Pathway with Exceedance of SL

Notes:

1. The resident refers to off-site receptors
2. Inhalation of dust for off-site receptors is likely insignificant.
3. Dermal contact exposure pathway is incomplete for PFAS
4. No current active construction at the Facility
5. The only exceedances of the SL were in groundwater samples upgradient from AOI 1, suggesting a release unrelated to AOI 1.

Figure 7-1
Conceptual Site Model, AOI 1
NHNGTS

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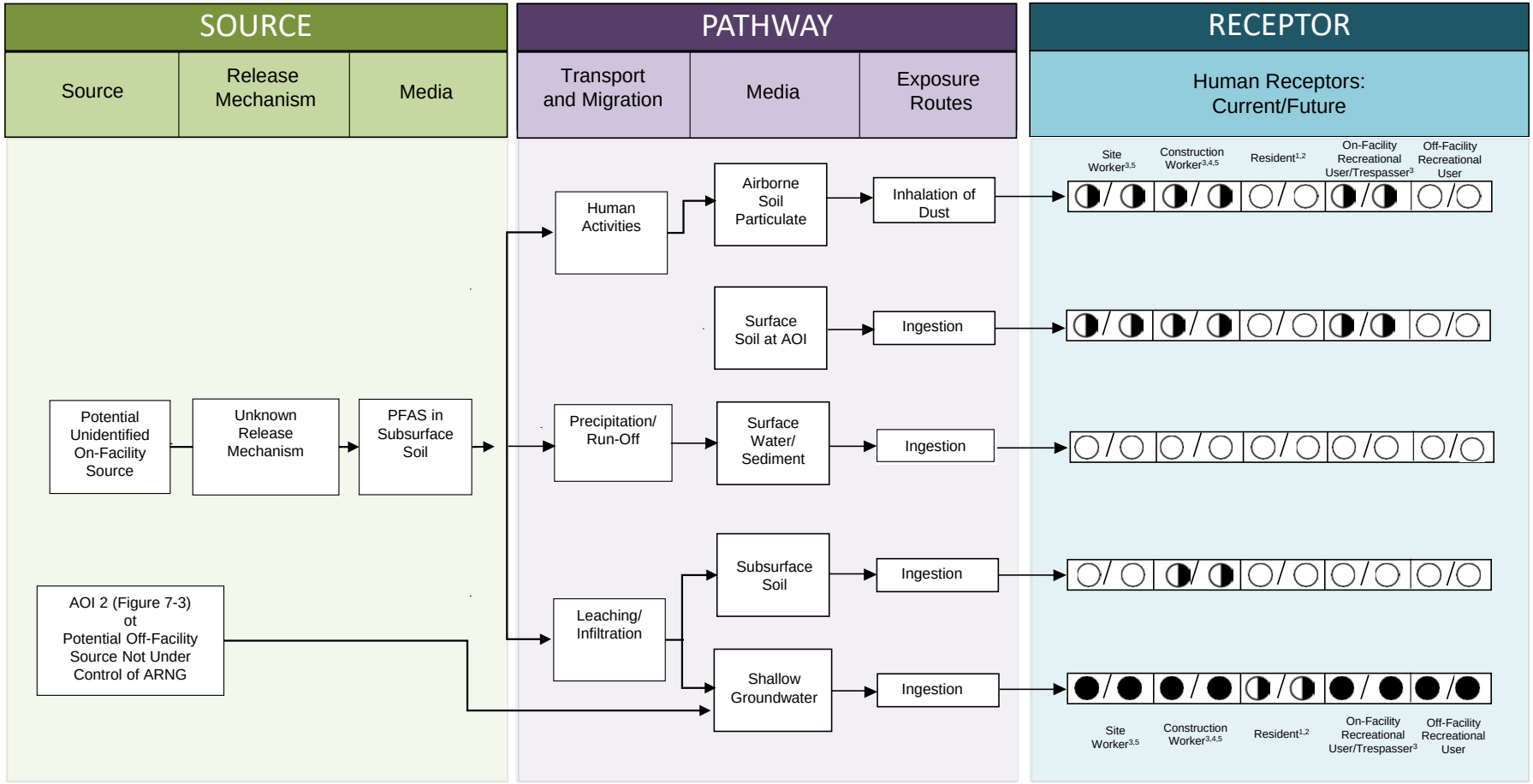

LEGEND

- Flow Chart Continues
- Incomplete Pathway
- Potentially Complete Pathway
- Potentially Complete Pathway with Exceedance of SL

Notes:

1. The resident refers to off-site receptors
2. Inhalation of dust for off-site receptors is likely insignificant.
3. Dermal contact exposure pathway is incomplete for PFAS
4. No current active construction at the Facility

Figure 7-2
Conceptual Site Model
Potentially Unidentified Source
NHNGTS

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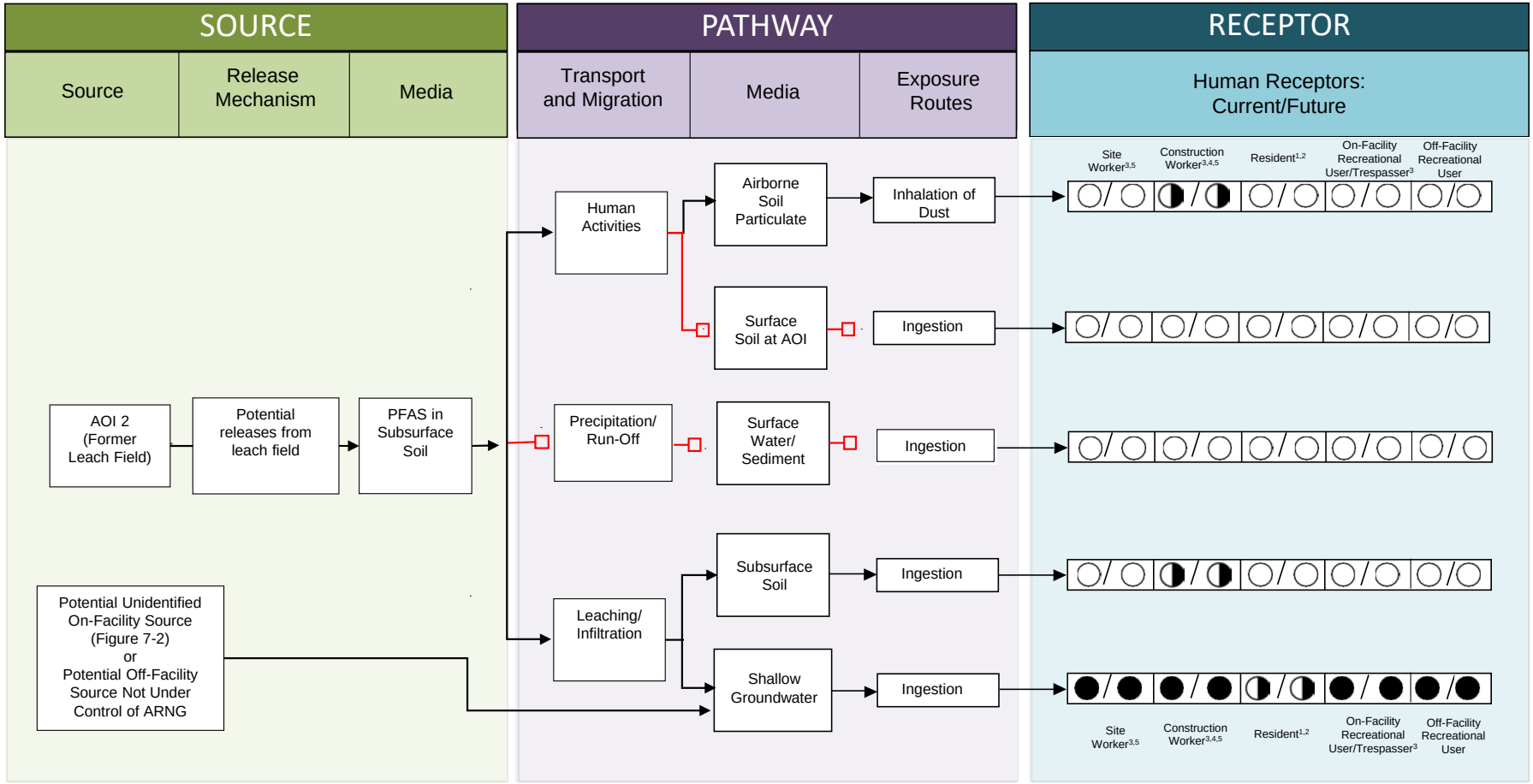

LEGEND

- Flow Chart Stops
- Flow Chart Continues
- Incomplete Pathway
- Potentially Complete Pathway
- Potentially Complete Pathway with Exceedance of SL

Notes:

1. The resident refers to off-site receptors
2. Inhalation of dust for off-site receptors is likely insignificant.
3. Dermal contact exposure pathway is incomplete for PFAS
4. No current active construction at the Facility

Figure 7-3
Conceptual Site Model, AOI 2
NHNGTS

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8. SUMMARY AND OUTCOME

This section summarizes SI activities and findings. The most significant findings are summarized in this section and are reproduced directly or abstracted from information contained in this report. The outcome provides general and comparative interpretations of the findings relative to the SLs.

8.1 SI ACTIVITIES

The SI field activities at the Facility were conducted from 9 to 23 May 2022. The SI field activities included soil and groundwater. Field activities were conducted in accordance with the UFP-QAPP Addendum (EA/Wood 2022), except as previously noted in **Section 5.8**.

To fulfill the project DQOs set forth in the approved SI UFP-QAPP Addendum (EA, 2021), samples were collected and analyzed for a subset of PFAS by LC/MS/MS compliant with QSM 5.3 Table B-15 as follows.

- Seven (7) soil samples from three locations (AOI01-01, AOI01-02, and AOI01-03);
- Six (6) grab groundwater samples from temporary well locations;
- Fifteen (15) QA/QC samples.

An SI is conducted when the PA determines an AOI exists based on probable use, storage, and/or disposal of PFAS-containing materials. The SI includes multi-media sampling at AOIs to determine whether or not a release has occurred. The SI may conclude further investigation is warranted, a removal action is required to address immediate threats, or no further action is required. Additionally, the CSMs were refined to assess whether a potentially complete pathway exists between the source and potential receptors for potential exposure at the AOIs, which are described in **Section 7**.

8.2 OUTCOME

Based on the results of this SI, further evaluation is warranted for a potential source upgradient of AOI 1. Based on the CSMs developed and revised based on the SI findings, there is potential for exposure to receptors from sources upgradient of AOI 1 on the Facility resulting from historical DoD activities.

Sample chemical analytical concentrations collected during the SI were compared against the project SLs in soil and groundwater, as described in **Table 6-1**. The following bullets summarize the SI results relative to the SLs:

At AOI 1 – Current Leach Field:

- PFOS, PFOA, and PFBS were detected in groundwater below their respective SLs at AOI 1.

- PFOA was detected in soil at AOI 1 at a concentration that is several orders of magnitude below the SL.

- Based on the results of this SI, no further evaluation is warranted for AOI 1.

At Potential Source Area Upgradient of AOI 1

- PFOA exceeded the SL in groundwater in a temporary well located upgradient of AOI 1 (on the Facility) with a maximum concentration of 6.1 J+ ng/L. These results, in conjunction with the Facility topography, may indicate a potential source upgradient of the current leach field. The detections in the groundwater at locations upgradient of AOI 1 may be related to the former leach field (AOI 2), an unidentified on-Facility source, or a potential off-Facility source not under control of ARNG. Potential upgradient sources will be investigated as part of the RI.

- Based on the results of this SI, further evaluation is warranted for a potential source upgradient of AOI 1.

At AOI 2 – Former Leach Field:

- During preparation of the SI report, information was provided from NHARNG indicating that the former leach field had not been in the same location as the current leach field, as was previously identified, and the location had been upgradient to the southwest. Based on this information, the former leach field was designated as AOI 2 and will also be investigated as part of the RI.

Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the CSM developed during the PA and revised based on SI findings, the presence of HFPO-DA is not anticipated at the facility because HFPO-DA is generally not a component of MIL-SPEC AFFF and based on its history including distribution limitations that restricted use of GenX, it is generally not a component of other products the military used. In addition, it is unlikely that GenX would be an individual chemical of concern in the absence of other PFAS.

Table 8-1 summarizes the SI results for soil and groundwater and the rationale used to determine if an AOI should be considered for further investigation under CERCLA and undergo an RI.

Table 8-1. Summary of Site Inspection Findings and Recommendations

AOI	Potential Release Area	Soil – Source Area	Groundwater – Source Area	Future Action
1	Current Leach Field	◐	◐	No Further Action
	Source Upgradient of AOI 1	TBD	●	Proceed to RI
2	Former Leach Field	TBD	●	Proceed to RI

Legend:
● = Detected; exceedance of screening levels
◐ = Detected; no exceedance of screening levels
○ = Not detected
TBD = to be determined

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9. REFERENCES

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